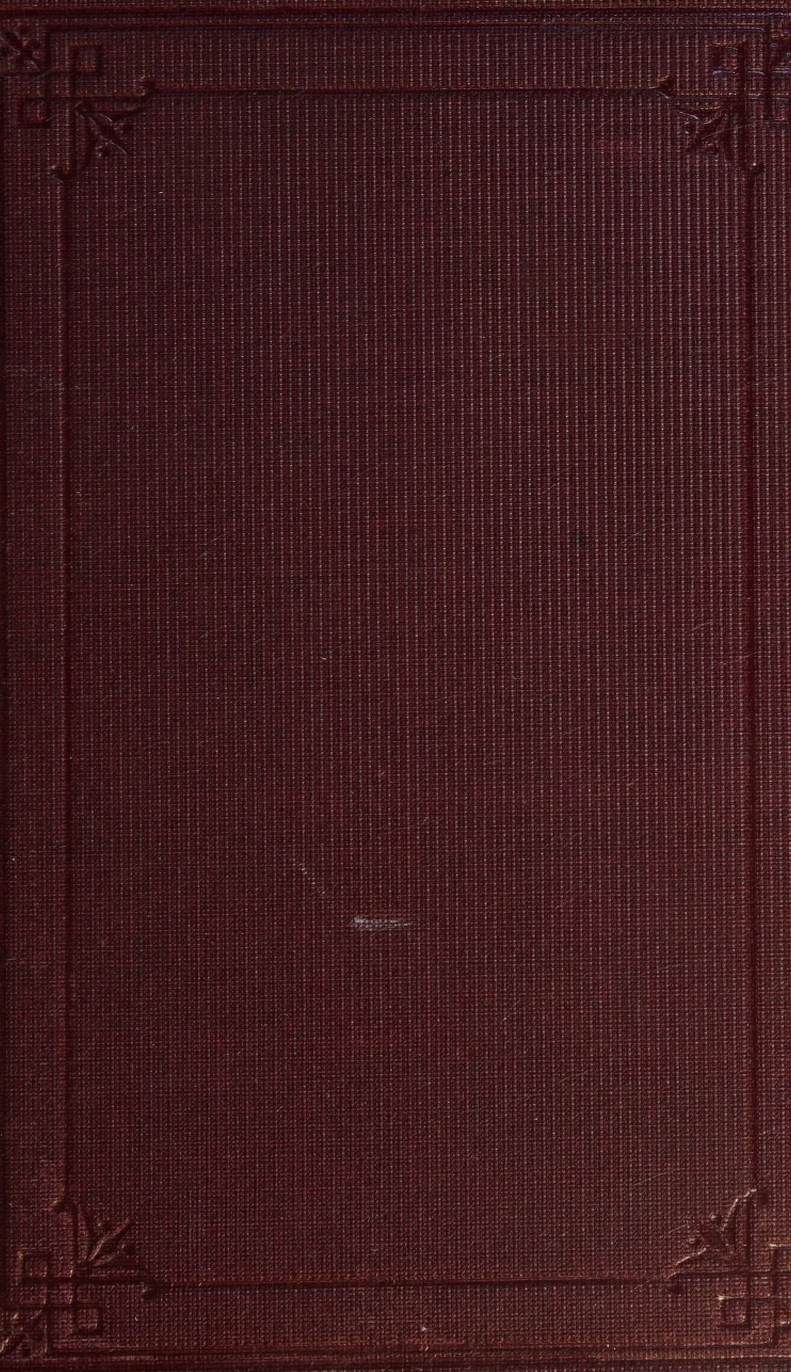


THE
Practical Medicine Series

COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS
IN MEDICINE AND SURGERY

UNDER THE GENERAL EDITORIAL CHARGE OF

CHARLES L. MIX, A. M., M. D.

PROFESSOR OF PHYSICAL DIAGNOSIS IN THE NORTHWESTERN
UNIVERSITY MEDICAL SCHOOL

VOLUME X
NERVOUS AND MENTAL DISEASES

EDITED BY

HUGH T. PATRICK, M. D.

PROFESSOR OF NEUROLOGY IN THE CHICAGO POLICLINIC, CLINICAL
PROFESSOR OF NERVOUS DISEASES IN THE NORTHWESTERN
UNIVERSITY MEDICAL SCHOOL; EX-PRESIDENT
CHICAGO NEUROLOGICAL SOCIETY.

PETER BASSOE, M. D.

ASSISTANT PROFESSOR OF NERVOUS AND MENTAL DISEASES,
RUSH MEDICAL COLLEGE.

SERIES 1915

CHICAGO
THE YEAR BOOK PUBLISHERS
327 S. La Salle Street

Copyright, 1915
BY
THE YEAR BOOK PUBLISHERS

TABLE OF CONTENTS.

DISEASES OF THE NERVOUS SYSTEM.

SYMPTOMATOLOGY 5- 9
THE NEUROSES 9- 49
  Neuroses of the War 9- 18
  Vagotonia 18- 28
  Epilepsy 28- 39
  Migraine 39- 45
  Raynaud's Disease 45- 47
  Psychoanalysis 47- 49

THE CEREBROSPINAL FLUID AND DISEASES OF THE MENINGES 49- 59

SYPHILITIC DISEASES OF THE NERVOUS SYSTEM 59- 78

DISEASES OF THE BRAIN 79- 92
  The Cerebrum 79-114
  The Basal Ganglia 92-106
  The Pineal Body 106-109
  The Hypophysis 109-114

DISEASES OF THE SPINAL CORD 114-138
  Traumatic Affections 114-119
  Spinal Decompression 119-123
  Toxic Affections 123-127
  Syringomyelia 127-131
  Multiple Sclerosis 131-133
  Acute Anterior Poliomyelitis 133-136
  Spinal Cord Tumor 136-138

DISEASES OF THE SYMPATHETIC AND SPINAL GANGLIA 138-146

DISEASES OF THE PERIPHERAL NERVES 146-158

MISCELLANEOUS 158-168

MENTAL DISEASES.

GENERAL CONSIDERATIONS 169-190

MENTAL DEFECT AND DELINQUENCY 190-213

INSANITY AND THE WAR 213-224

DEMENTIA PRAECOX 224-227

MANIC-DEPRESSIVE INSANITY 227-231

DISEASES OF THE NERVOUS SYSTEM.

SYMPTOMATOLOGY.

Defense Reflexes. According to J. Babinski[1] the first one to observe the so-called defense reflexes was Prochaska, who in 1784 described the quick movements of the legs produced by tickling the foot of a frog in which the cord had been severed.

Later the same phenomenon was described by Schiff, Vulpian, Brown-Sequard and others. Pierre Marie and Foix, taking cognizance of Sherrington's experiments, proposed the term "reflexes of medullary automatism" as more correct than defense reflexes. According to Babinski, the so-called dorso-plantar flexor reflex described by Bechterew is the same phenomenon. The early physiologic observations were lost sight of by clinicians after the discovery of the tendon reflexes and it is only in the last 15 years that the defense reflexes have again received attention. Babinski has endeavored to determine the behavior of these reflexes in man, and their clinical significance. In a case of complete paralysis of the legs from compression of the cord one usually observes the following type of reflex: There is a series of flexion movements of the various segments of the lower extremity, the foot is raised and flexed on the leg, the leg on the thigh and the thigh on the trunk; sometimes adduction of the thighs is added to the other movements. While this is the most frequent type, there are many variations. Thus there is an extensor type in which all of these parts are extended, or there may be combinations. Usually in abnormal states these reflex movements are slow, but there are exceptions; for instance,

---

(1) Rev. Neurol., March, 1915, p. 145.

in Friedreich's ataxia they are very rapid and much exaggerated. There is also great variation in the amplitude of the movements. Sometimes the slightest touch of the extremity may produce a whole series of flexor movements, while in other cases severe pinching may cause only a flexion of the foot.

Similar defense movements are seen in the upper extremities and show the same variations in character and intensity, but more frequently than those of the legs they are confined to one side. Even the muscles of the trunk may participate, as may those of the intestinal walls and bladder as evidenced by expulsion of gas or involuntary micturition.

Do similar reflexes occur in the normal state? Babinski is inclined to answer in the affirmative and to consider the pathologic reflexes described as exaggerations of the physiologic ones. Accepting this view it is necessary to determine the characteristics which distinguish the pathologic from the normal type of reflex. To some extent the increased amplitude of movement serves this purpose but Babinski finds that the most reliable sign of a pathologic defense reflex consists in the fact that it may be obtained by pinching the lower extremity outside of the sole of the foot, as on the dorsum of the foot or on the leg, for pinching in these localities never produces the reflexes in the normal state.

As to the clinical significance, one may say that the pathologic defense reflex indicates a lesion of the pyramidal system and has the same significance as the extensor sign of the big toe and increased tendon reflexes. Babinski does not agree with Marie and Foix who believe that Babinski's toe sign is merely part of the defense reflexes. He finds that it is not unusual to obtain plantar flexion of the big toe along with other flexor movements on stroking the dorsum of the foot, while stroking the sole of the foot produces the typical extension of the big toe. The intensity of the defense reflex is not always proportionate to that of the tendon reflexes.

The condition of the defense reflexes may be of value in locating a lesion compressing the cord, as they are exaggerated in the whole cutaneous territory connected with the cord below the point of compression. Observations on the relationship between the area of anesthesia and the area of increased defense reflexes have led Babinski to formulate the following rule: When, in a case of compression of the cord, a variation between the two areas is considerable, we are probably dealing with an extradural tumor or pachymeningitis, *i. e.,* lesions extending for a considerable distance. On the other hand, when the areas of anesthesia and of increased defense reflexes coincide the lesion is probably an intradural tumor, one usually extending only a short distance. Babinski has had occasion to verify the value of the defense reflexes in spinal localization in 16 cases, namely, two of stab wound of the cord with Brown-Sequard syndrome; one of pachymeningitis cervicalis hypertrophica; the rest tumors, three of which were extradural.

The Application of Edinger's Exhaustion Theory to Types of Paralysis. On the occasion of the sixtieth birthday of the famous Frankfurt neurologist, Edinger, various articles by his pupils and colleagues were published in his honor, among them one on the above subject by Siegmund Auerbach,[2] also of Frankfurt. [A previous article by Auerbach on this subject was reviewed in detail in the Practical Medicine Series, 1911, Vol. 10, p. 11.] According to Edinger, all diseases of the nervous system may be divided into focal affections, toxic affections and exhaustion diseases (Aufbrauch Krankheiten, *i. e.,* "used-up" states). The latter in turn may be divided into three classes: 1. Diseases caused by too great demand on normal nerve paths. Examples are occupation atrophy and occupation neuritis. 2. Diseases in which the presence of toxic agencies, such as syphilis or lead, prevent proper restitution of the nerve paths so as to bring on degeneration in the presence of normal functional demands. Examples: Multiple neuritis, tabes, combined system diseases. 3. Congenital insufficiency of individual nerve paths causing them to break down prematurely under the stress of the ordinary

---

(2) Deutsche Zeitschr. f. Nervenheilk., 1915, Vol. 53, p. 449.

functional demands. Examples are the various hereditary degenerations (such as Friedreich's ataxia), spastic paraplegia, amyotrophic lateral sclerosis and progressive bulbar paralysis, primary non-tabetic optic atrophy and probably also progressive nerve deafness.

While Auerbach does not fully accept this classification as satisfactory, he believes that the underlying principles are not sufficiently recognized. Thus he relates that while he was on a recent visit to America, Dercum of Philadelphia pointed out to him that negroes with their exceedingly well developed muscular and spinal nervous systems rarely develop tabes, while paretic dementia is very prevalent among the negroes of large cities where too great demands are made on their brain functions. In the present article Auerbach further elaborates his previously reported observations of modifications in the usual localizations and types of peripheral paralysis in connection with various occupations. He first recalls his noteworthy case, recorded some ten years ago, of a peculiar selective involvement of the muscles of the neck, shoulder-girdle and arm, more marked on the left side, in a case of alcoholic neuritis in a waiter, who habitually carried heavy trays on his left hand.

After reiterating the eight mechanical, physiologic and anatomic factors enumerated in his previously mentioned article, and after further discussing the application of these theories to lead neuritis, the post-diphtheritic paralysis of accommodation and other forms of peripheral paralysis, Auerbach formulates the following law: Those muscles become most readily and most completely paralyzed and recover most slowly and incompletely which possess the least power (as indicated by the muscle weight) and which have to exercise their function under the most unfavorable mechanical, physiologic and anatomic conditions, while muscles favorably situated in these respects largely escape involvement.

Clinical Research on Cutaneous Pain Sense by Means of the Faradic Needle. E. Carati,[3] working in Dejerine's clinic in Paris, made careful studies of sensation by means of a fine needle connected with the negative

---

(3) Rev. Neurol., May-June, 1915, p. 296.

pole. The patients were soldiers with wounds of the ulnar, radial and internal saphenous nerves and three soldiers with wounds of the spine causing sensory disturbances of spinal cord origin. The conclusions reached are as follows:

1. The faradic current offers a very exact method of studying cutaneous pain sense.
2. The area of disturbed pain sense, whether decreased or increased, is always more extensive as revealed by this method than is the area of ordinary hypesthesia, anesthesia or hyperesthesia.
3. Sometimes hyperesthetic areas are less sensitive to the faradic current, but in the case examined the form of hyperesthesia was rather a disagreeable paresthesia in the area supplied by a regenerating nerve.

THE NEUROSES.

THE NEUROSES OF THE WAR.

The War and the Traumatic Neuroses. H. Oppenheim[4] first sketches the history of the conception of the traumatic neuroses. In some quarters the influence of the mechanical injury was considered unimportant and the emphasis altogether laid on the psychic trauma. Oppenheim also has laid stress on the importance of the latter, but still maintains that many symptoms are the result of the physical injury. He believes that the fine organization of nervous tissue may be injured in its most delicate physical processes aside from such gross changes as hemorrhage, inflammation, degeneration and necrosis. There has been a tendency to exaggerate the rôle of simulation, some authorities even maintaining that a robust working man has no claims on hysteria and neurasthenia. Gradually the traumatic neuroses became discredited and the symptoms were ascribed to hysteria or simulation, with the additional view that there was no sharp line between the two.

Then came the war. The first experiences seemed to confirm the conventional view. The first cases of nervous

---

(4) Berl. klin. Wochenschr., 1915, Vol. 25, p. 257.

breakdown observed were thought to be in predisposed individuals in whom the psychic trauma of the war only brought out what already lay dormant. However, with increasing experience, matters appeared in a different light. Oppenheim himself has had opportunity to observe a large number of cases. In the majority no neuropathic disposition existed. The etiologic factors may be divided into mechanical, psychic and mixed. The last named consist chiefly of strong detonations. Their influence on the acoustic nerve is undoubtedly mechanical but it is accompanied by the psychic effect of fright. The same is true of the effect of passing projectiles, where we are dealing with the violence of the air pressure and the mental excitement. Exhaustion from marches, lack of sleep and insufficient nourishment are additional factors.

Regarding symptoms and symptom complexes connected with the so-called traumatic neuroses, Oppenheim finds that the war has confirmed our previous experience, deepened our knowledge and given a firmer foundation to our theories. The clinical picture rarely corresponds to a pure type of the sharply limited neuroses but is much more frequently mixed. The phenomena of *neurasthenia* are in the foreground, such as headache, dizziness, insomnia, irritability, sensitiveness to noise, general exhaustibility, tremor. Cardio-vascular and secretory symptoms are frequent, namely, palpitation, rapid and changeable pulse-rate, excessive perspiration; slight elevation of temperature is another symptom in this group. The tendon reflexes are increased.

Symptoms of *hysteria* are also frequent, among them aphonia, mutism, abasia, paralysis or anesthesia of limbs. However, the ordinary hysterical personality is often missing. Oppenheim has not seen typical hysterical attacks, nor heard complaints of the globus sensation. In most cases the hysterical features were combined with neurasthenic ones and while the former ones were usually quickly removed by suggestion, the latter require a long time and disappear only very gradually.

Hence, the "war neurosis" is usually a combination of neurasthenia and hysteria. Tics and various kinds of muscular cramps occur, many of them not of hysterical character. In some cases every attempted movement of an extremity leads to tonic spasm of its entire musculature, followed by clonic spasm and fibrillary tremor, a condition which answers the descriptive term "innervation spasm with tremor." While admitting the possible psychic origin of this symptom, Oppenheim believes that the war experience has justified his previous standpoint that the matter is more complicated. The fear and startling caused by violent explosions are a psychic factor, but as a similar disturbance of motility occurs in connection with injuries of peripheral nerves we must assume that these tremendously powerful impulses "may cause a disturbance in the central mechanism of innervation, perhaps the slipping of a link from a chain, a displacement of the finest elements, a blocking of paths, a solution of continuities, a diaschisis, in short, a process which escapes the eye of the microscopist, which produces no definite disturbance of any particular nervous structure but nevertheless creates an obstacle to the passage of motor impulses." The highest degree of this disturbance is the complete inability to move the limb, the patient exclaiming he does not know how to proceed. It seems as if the memory picture concerned with the particular movement is lost, hence Oppenheim uses the term "akinesia amnestica" for this type of disability. Unlike hysterical paralysis, recovery is slow and gradual.

Another type of functional but not hysterical paralysis is the so-called "reflex paralysis," which is analogous to the arthritic muscular atrophy and explained by "impulses arising from the injured limb under unknown conditions which reach the anterior grey horns and prevent impulses coming from the brain to pass through them."

The Psychoneuroses of the War are discussed in some detail by Gustave Roussy,[5] who begins by saying that the subject has a great theoretical and practical interest. In the first place, we are able to observe a large number of cases in which the etiologic factors and clinical phenomena unfold themselves within a short space of time so as to place them more readily within our mental grasp. In

---

(5) Rev. Neurol., May-June, 1915, p. 425.

the second place, these conditions are readily curable, providing they are properly handled in suitable surroundings. The author does not include the true psychoses, but confines himself to the group of the psychoneuroses which includes disturbances of neurasthenic, psychasthenic and hysterical character. He has not encountered many cases of neurasthenia. These are difficult to treat in military hospitals and are best sent away on furlough. The other cases studied by him, 54 in number, are divided in the following seven groups:

1. *The convulsive form of hysteria.* The attacks vary from mere trembling, nervous chills and weeping to the classical hysterical convulsions. All of the nine patients in this group give a history of previous nervous manifestations; so the war experiences have served only to furnish the necessary emotion or suggestion. Strict military discipline to the extent of threatening with the lockup is good psychotherapy in these cases.

2. *Deaf-mutism produced by shock from shell explosion.* Three zouaves were thrown down by an unusually violent shell explosion on January 14. Two of them bled from the nose and ears and all three realized at once that they had become totally deaf, and they were also completely mute. Three days later they were admitted to a hospital in Paris and communicated only by signs. On account of the similarity of the symptoms, Roussy suspected hysteria or even simulation and had the three men separated and isolated. He promised each one that he would get well in a day or two. As a matter of fact two of them recovered speech completely, and hearing partly, the next day and the third one began to speak in two days. Diagnosis of hysterical deafmutism could therefore be made, although organic injury to the ears existed in all three cases and some degree of difficulty in hearing remained.

3. *Cerebral and spinal concussion.* Here are grouped the cases of nervous symptoms coming on suddenly after shell explosions in the vicinity. They are always first called cases of concussion, but the symptoms nearly always disappear rapidly after a brief sojourn in the hospital.

4. *Functional hemiplegia or paraplegia.* One of the patients with typical hysterical hemiplegia of three months' standing gives the history of a similar condition at the age of 16 years lasting a whole year.

5. *False neuritis.* In these patients, pains resembling those of brachial, crural or sciatic neuritis have appeared without wounds. The cases with symptoms of sciatica are always difficult. Roussy first examines the blood and spinal fluid as certain cases are of syphilitic origin. With these tests negative, he proceeds to give one or two epidural injections of novocaine which in true sciatica bring great immediate or permanent relief. On the other hand, in the neurotic who is fond of exaggerating his symptoms, these manipulations give additional annoyance and no relief.

6. *Painful paralysis of an arm or leg, usually with contracture.* He has observed 16 cases of functional paralysis of one limb with contracture and more or less marked anesthesia. They divide themselves in three classes: (a) Cases caused by explosion of shells at a distance. (b) Actual bullet or shell wounds often in the vicinity of joints causing a certain amount of genuine arthritis to which the hysterical phenomena are superadded. (c) Post-operative. Here we have what may be termed a logical form, in which the paralysis affects the region near the wound, and a paradoxical form in which the paralysis affects a distant region. Thus, a lieutenant developed a painful paralysis of the right leg after a bullet wound of the submaxillary region, although he had not even fallen or injured his lower extremity in any way.

7. *Simulation.* Four patients plainly simulated suffering.

In reviewing his cases the author states that the war has not produced any form of functional nervous disorder which we had not observed in times of peace, especially in connection with railway accidents. In cases without neurotic disposition he usually finds that there has been a slight organic disorder on which the functional neurosis has become engrafted, especially an old neuritis or arthritis.

The great practical lesson is the importance of avoiding early diagnostic errors by sending the wounded as rapidly as possible to hospitals where the services of specialists can be obtained. If a patient once has been erroneously told that he has an organic lesion it may require a long time to dissuade him. In general, the earlier proper psychotherapy is instituted the sooner the patient recovers and the sooner he is able to return to his regiment.

Functional Nervous Disorders in Connection with Wounds in the War. Examples of three common types are given by Pierre Marie and Mme. Athanassio-Bénisty.[6]

1. After a wound of the arm a soldier showed the typical findings, including altered electric reactions, of paralysis of the median nerve. However, he also developed paralysis of the deltoid, biceps, triceps and many other arm muscles which showed normal electric reactions. This superadded paralysis was clearly hysterical, particularly as the bullet wound was so situated that it could not possibly have affected either the circumflex or musculospiral nerves.
2. A soldier with a bullet wound of the shoulder had typical hysterical attacks with crying and contortions of the limbs. This individual was of a neurotic type and had been subject to convulsive seizures in childhood.
3. A soldier with partial paralysis of both legs but able to walk with crutches showed no changes in the reflexes or other evidence of organic disease. He had sustained a shock by the explosion of a shell nearby but was not wounded.

A Case of Permanent Tachycardia of Emotional Origin. In December, 1914, Dejerine and Gascuel[7] presented to the Paris Neurological Society a soldier 29 years old who on September 24 had been knocked over by the force of a shell exploding nearby, but was not wounded. After being dazed for an instant he got up, felt extremely nervous and noticed that his heart beat violently. Six days later he was admitted to a hospital in Paris and the heart was found to beat 130 to 140 times

---

(6) Rev. Neurol., May-June, 1915, p. 424.
(7) Rev. Neurol., Mar., 1915, p. 211.

a minute, but regularly. There was no murmur and percussion showed normal size. The tachycardia has persisted with paroxysms of greater severity, up to 180 beats per minute, in which the patient shows great anxiety. He is depressed, pays no attention to his surroundings, and occupies himself with his heart and his insomnia. The condition has remained unchanged during two months' observation. The authors remark that such permanent tachycardia with a general neurasthenic state has frequently been observed from earthquakes and railway accidents.

In the discussion Alquier pointed out the impossibility of distinguishing between the condition here presented, corresponding to what he himself has described as vasomotor neurosis, and atypical exophthalmic goitre. He emphasized that both conditions, if they are not identical, depend on a special nervous predisposition and that the accidents referred to are only exciting causes. Neither affection ever develops without the special predisposition.

Emotional Shock Following Shell Explosion. Several cases are related by Fiessinger.[8]

One case was that of a non-commissioned officer of heavy artillery, who had received a severe bruise—but no more serious damage—on the left thigh. The patient had been a bright and cheerful man with no antecedent nervous manifestations, family or personal. To any inquiries he replied in monosyllables, and after a few questions his expression and manner indicated profound fatigue. His memory appeared normal, but there was a marked alteration of intelligence. He preserved absolute silence, appeared to be extremely melancholy, and suffered from insomnia, intense headache, and distaste for food. The reflexes were normal, and muscular power was retained. Subcutaneous injections of strychnine resulted in some improvement. A similar case was that of a lieutenant of artillery. There was no trace of a wound in this case. The patient appeared to be in a state of stupor; he refused all nourishment and preserved a fixed stare. After two days there was a phase of nervous

---

(8) Jour. des pract., Feb. 15, 1915, Abstract in Brit. Med. Jour. July 31, 1915.

excitement, followed by one of melancholy and intense depression. The author points out that the explosion of heavy shells provokes a terrifying impression on nervous subjects, and that this shock is less marked on those who have been seriously wounded otherwise. With regard to the nature of the attack, the author states emphatically that in none of the cases referred to was there any evidence of simulation, and that the condition was to be regarded as a traumatic neurosis, only occurring in those of susceptible nervous system. Rest treatment and suggestion were beneficial, and there were few ultimate ill effects.

A case of loss of personality from shell shock is related by Antony Feiling,[9] who prefaces his detailed report with the following interesting remarks:

"The present campaign in Flanders has made such unexampled demands on the nervous system of the soldier that we are not surprised to meet with many cases of neurasthenia, hysteria, and various disturbances of the special sense organs. Numerous cases of blindness, deafness, dumbness, and loss of memory have already been reported, as well as the more common cases of functional paralysis of a limb or limbs, and all have aroused considerable interest and discussion as to their nature and appropriate treatment. The majority of cases of loss of memory hitherto recorded have been generally of a more or less transitory nature; moreover, the period of time covered by the amnesia has been, as a rule, only that just before, during, and immediately following the trauma, whether such was physical or mental, or both.

"The case which I wish to record here is one of exceptional interest. It amounts, in fact, to a complete dissociation or obliteration of personality. The term "double personality" is hardly applicable, as will appear from subsequent remarks. It may be regarded as a case of loss of memory or amnesia of such a degree that all conscious memories of the patient's life, as well as the countless memories forming his knowledge of letters, objects, and life in general were completely suppressed.

The patient, a bandsman, 24 years old, had been buried

---

(9) Lancet, July 10, 1915.

in a trench near Ypres in October, 1914. When brought out he showed no evidence of physical injury but on account of his mental state he was transferred to a hospital in Manchester, where it was noted on his admission that he "speaks quite sensibly, understands, and remembers anything which took place since he was buried, but as regards matters previous to that his mind is blank. He did not know his own father or relatives." He said he had come to himself in a strange place, which he was told was Manchester. His statements concerning his subsequent stay in the hospital were perfectly reliable. When taken to visit his old home he did not recollect that he had ever seen the place before, and as to his parents, he said that he did not know them, but took them on trust, having been told that they were his parents. On the whole he appeared to be happy and contented but occasionally expressed his disappointment at not being able to recall his memory.

"As he often went out of the hospital for motor drives and other excursions, numerous incidents occurred, due to his ignorance of all that he had not seen since his injury. Some were distinctly comic. On one occasion he went to the Zoological Gardens. He had been told previously by one of the other soldiers in hospital that an elephant was a 'little furry animal,' and had been shown a toy one about six inches long. His astonishment at seeing the real article may be well imagined. On the same occasion he tried to stroke one of the lions, being only prevented by one of the attendants from putting his hand through the bars of the cage."

As he made no progress, it was decided to try hypnotism, which was commenced in March, and altogether twenty-five sittings were held. In the hypnotic state he was able to relate the events of his childhood and those preceding the war as well as the details of his experiences in the battle of Ypres. In the hypnotic state he knew nothing of what had happened after the battle and in his normal state, or "state number two," he recalled nothing that had transpired during "state number one" in the hypnosis. Even his dialect and handwriting differed in the two states and when shown what he had written in hypnosis, he denied that it was his writing. When told to write the same sentences again, various minor points of difference in the writing were at once apparent.

"On one occasion he was hypnotized in the presence of his father, whom in his ordinary state he regarded with no very great interest and certainly with no obvious affection. On being told to open his eyes, his attention was directed to the presence of his father. He immediately jumped up, and with every sign of pleasure exclaimed, 'Why, dad, how did you get here?' He then walked across the room, shook his father warmly by the hand, and kissed him with a degree of spontaneous affection previously entirely absent. His father was much affected, and believed for the moment that his son had 'come all right again.'"

The hypnotic treatment was not successful in fusing the two personalities and he was discharged from the hospital in May as not amenable to further treatment.

VAGOTONIA.

Vagotonia. A monograph on this subject is by Hans Eppinger and Leo Hess[1] of Vienna. The anatomy and physiology of the vegetative nervous system are first discussed along lines similar to those laid down by S. A. K. Wilson, whose physiologic, pharmacologic and clinical applications were reviewed at length in the Practical Medicine Series, 1913, Vol. 10, page 157. To repeat, the vegetative nervous system is divided into the *sympathetic system proper* consisting of the sympathetic cord and its ramifications in the thoracic and abdominal viscera, vascular system, skin and genitalia; and the *autonomic system* consisting of three divisions, *a*, the nerve plexus from the midbrain segments passing through the oculomotor nerves and ciliary ganglia to the eye, *b*, the bulbar or vagus system, and *c*, the sacral division supplying the lower part of the large intestine, bladder and genitalia. It is obvious that practically all parts of the vegetative organs are supplied by both of these systems. Only the

---

(1) Translated by Drs. Krus and Jelliffe. Appears serially in Jour. Nerv. and Ment. Dis., Mar. 1914 to July 1915. Also as No. 20 of the Nervous and Mental Monograph Series.

sweat glands, pilomotor muscles and vascular muscles of the viscera receive sympathetic but not autonomic fibres.

It is remarkable that intertwined as these two fibre systems are their actions are largely antagonistic. Electric investigations have already shown that in many organs the manifestations caused by stimulation of the fibres of one system may be abolished when one stimulates the fibres of the other. However, the fact that the different nerves of the two systems are so commingled makes anatomic differentiation impossible and physiologic testing extremely difficult. Fortunately, pharmacology here comes to our aid. Adrenalin is known to act solely upon the sympathetic system, its action being similar to that of electric stimulation of the sympathetic fibres. Similarly, the autonomic system can be influenced exclusively by certain drugs. Muscarine, pilocarpine and physostigmine produce effects similar to those obtained by stimulation of the autonomic fibres, while atropine is capable of preventing many of the effects produced by such stimulation. An extensive table is presented, which gives in detail the action of these drugs on the various organs and shows well the antagonistic action of the two systems. While all parts of the sympathetic system are about equally affected by adrenalin, the various parts of the autonomic system behave differently. Thus atropine has practically no action on the pelvic nerves while it acts powerfully on the cranial part of the autonomic system. Pilocarpine acts strongly upon secretory fibres but little upon the heart, while muscarine and physostigmine act strongly on the heart.

"It is of great physiologic interest that the stimulant of the sympathetic nervous system, adrenalin, is produced by almost all vertebrates, and that it lies in close anatomic relationship with the sympathetic system. It is formed just where it exerts its greatest action, since the so-called chromaffin, the adrenalin-forming cells, accompany the sympathetic in its course. Through the investigations of Ehrmann, we know that adrenalin is continuously flowing from the adrenals and thus exerts a continuous influence upon the sympathetic, from which it must be concluded that the stimulating effect of the sympathetic upon its end organs is not an intermittent one and only produced when the affected organs become active, but is in reality continuous.

"It is probable that a similar state exists with reference to the autonomic system and that a specific analogue to adrenalin, an autonomin exists, even though it is not known at present. Substitutes for this are found in certain poisons which have been mentioned—pilocarpine and physostigmine. These drugs act exclusively on the autonomic system. In this sense these two substances are valuable substitutes for the supposed physiological 'autonomin.' The study of pharmacologic substances shows that vagotropic and sympathotropic activities do not always exert a universal action, but have a special predilection for one or another branch of the two systems. If one recalls that certain physiologic hormones, as pituitrin, have also but a selective action on certain parts of one or the other vegetative nervous system, it is easy to conceive that similar conditions exist in the body and that many hormones may have definite relations only to a special branch of the two nervous systems."

Even if the autonomic hormone, "autonomin," has not been isolated, facts show that there must be some such substance which exerts a continuous stimulation upon the autonomic nervous system. Thus, section of the sympathetic pupillary fibres will cause persistent contraction of the pupils, while section of the autonomic fibres will cause dilatation. Similar results are obtained in many localities in the body where continuous impulses act upon smooth muscle, thus showing that there is a continuous stimulation of both of the antagonistic systems. Such a continuous activity of nerve impulses on smooth muscle cells is termed *tonic innervation.*

"Since the conception of vagus tone has been established in experimental physiology and in pharmacology, it is not amiss to attempt to apply it to clinical problems. Many observations support the idea that there are individual and varying degrees of tonus of the vagus system in man. The variations in activity of vagotonic drugs afford examples. In many individuals even small doses of atropin, which cut out already existing vagus impulses, produce marked tachycardia, dry mouth, fever, mydriasis, paralysis of the ciliary body, hallucinations and sometimes glycosuria. In others, the usual dose is practically without action. Similar variations occur with pilocarpine. One frequently hears physicians complain that many people do not sweat when pilocarpine is given. And other substances which act upon the vagal system, such as digitalis, morphine, scopolamine, hyoscyamine, etc., have varying degrees of action in different individuals. These variations are regarded as idiosyncrasies by analogy to the varying degrees of reactivity which individuals show to such drugs as iodine, cocaine, salicylic acid, etc. We may say at once that these as well as other clinical facts, such as respiratory arrhythmia, habitual bradycardia, etc., have furnished the means of drawing our attention to the variations of the tonus of the vagal system in man.

"We have designated this type of individual '*Vagotonics.*' Under the conception of vagotonia we include all those constitutional conditions in which, in addition to the manifestations of a functionally increased vagus tonus and increased irritability in the autonomic system, there also exists a condition of increased sensitiveness to pilocarpine. In the light of the previously described antagonism between the two parts of the vegetative nervous system, we may add as a further ear mark of the vagotonic disposition a relative decrease of reactivity to sympathetic stimuli."

The authors discuss in detail the physiologic considerations involved and the mechanism of the various symptoms connected with vagotonia as occurring in the eye, salivary glands, respiratory system, heart, gastrointestinal tract, etc. Anyone desiring to learn the detailed observations and deductions upon which the doctrines of the authors are based must read these chapters in full.

Clinical Picture of General Vagotonia. "We have been enabled to separate from the mass of nervous diseases which have hitherto been grouped under the names of neurasthenia, hysteria and nervousness a symptom complex, a disease picture which we have designated the neurosis '*vagotonia.*' This we regard as a functional *autonomic system disease,* for the reason that all of its symptoms may be identified with those of a state of stimulation of the autonomic nervous system. As the basis of this there must exist a vagotonic disposition in the patient; that is, an abnormal irritability of all or only a few autonomic nerves which under the influence of some adequate stimulus—a stimulus which may be less than that which would affect a normal autonomic system—may lead to the development of the symptom complex.

"On the one hand the vagotonic constitution may be the basis of a neurosis which may be separated from the group of neurasthenias, while on the other hand it may modify in a definite way the course of various organic diseases. As a matter of fact, many symptoms may be referred to autonomic stimulation, and it is the regular relationship of certain symptoms, such as asthmatic attacks and eosinophilia, which may be interpreted in the light of the conception of vagotonia."

The vagotonic disposition. The victims usually complain of some trivial gastrointestinal or so-called neurasthenic symptoms. Their actions are hasty and precipitous. The color of their faces is changeable, flushed or pale. The skin is often blotchy, the hands bluish red. A tendency to perspiration is usually present and the eyes appear large on account of the wide palpebral fissures. The sclera may be seen both above and below the corneal margin; myopia is often present and sometimes a mild convergent strabismus, but weakness of convergence (Moebius' sign) is never seen. While speaking the patients frequently swallow, saying they have too much saliva in the mouth. The tonsils are frequently enlarged and the patients say they get sore throats after the slightest exposure. Such patients usually give a history of having been operated on for adenoids or enlarged tonsils in childhood. The posterior pharyngeal wall is usually quite insensitive. Precordial distress is often complained of, marked pulsation at the apex and in the epigastrium may be seen, but even in the presence of excitement the pulse rate often does not rise above 60. The heart's action is unduly affected by the respiratory changes and arrhythmias may appear after drinking one or two glasses of carbonated water. There is a marked tendency to a feeling of fulness and distension immediately after eating, and to sluggishness of the bowels. Irritability of the urinary and sexual organs may also be present.

We are told that there are not many who will show all the signs and symptoms occurring in "general vagotonia." This condition must be distinguished from "local vagotonia," in which vagotonic symptoms are to be found only in some single system of the body.

Pathologically increased vagotonia. "Pharmacologic testing of various individuals shows that after the administration of pilocarpine conditions occasionally result which resemble very closely certain entities which we have learned to recognize clinically. Thus, after such an injection, gastric symptoms appear resembling those of hyperacidity or those of pylorospasm or cardiospasm. Or it may happen that heart symptoms resembling mild angina pectoris are found. In other cases there are respiratory disturbances, salivation, or even asthmatic attacks. In connection with the injection, diarrheas, urgency in micturition or defecation, spermatorrhea lachrymation, ptyalism or sweating may also appear.

"These manifestations following pilocarpine injections lead us to believe that such diseases, which in their fully developed form are known as angina pectoris vasomotoria, bronchial asthma, cardio- or pylorospasm, gastro-succorrhea, gall stone colic, tenesmus, etc., are genetically related to each other, inasmuch as they all may be induced by toxic agents which act upon the autonomic nervous system; and, furthermore, it would seem that they are made manifest on account of the basic vagotonic disposition of the patient, which favors their appearance. In many cases it is demonstrable that not only will atropine relieve the symptoms of the disorders just mentioned, showing that they are due to vagal irritation, but that latent manifestations of vagal irritation come to the surface in branches of the autonomic system other than those primarily involved in the disease."

Bronchial asthma. This is called the classical example of vagus stimulation in man and its production is explained as follows: "Due to an over-irritative state of the vagus even small stimuli acting upon it may produce spasm of the bronchial musculature. The result of this is that the alveolar air can not be forced out as readily as normally by the elastic fibres in the condition of 'passive' spasm, with the result that an excess of air remains in the alveoli. Furthermore, the autonomic stimulus produces not only muscular spasm but also increased secretion from the bronchial mucous membrane and added hinderance to expiration. An argument in favor of this conception of the part played by the vagus is the action of adrenalin. This diminishes the bronchial secretion with the result that the spasm seems to pass away." Asthmatic attacks may be accompanied by symptoms referable to other branches of the vagus such as sweating, dermographia, urticaria factitia, bradycardia, sometimes lowered blood pressure, uncomfortable feelings in the stomach or intestines, positive Graefe sign or laryngospasm due to closure of the rima glottidis.

As laryngospasm is so closely related to asthma, the authors are surprised that atropine has not been tried for relieving laryngospasm in children.

Vagotonic disorders of the stomach. The vagus acts on the stomach in three ways: 1, by maintaining the tone of the musculature; 2, by stimulating peristalsis: pilocarpine and physostigmine increase peristalsis while small doses of atropine inhibit it; 3, by increasing secretion. The spastic condition of the gastric musculature in vagotonics has been studied by means of the *x*-ray after bismuth meals. Sometimes the picture of hour-glass stomach is obtained, a strong wave of peristalsis having apparently divided the bismuth in two parts. "This spastic hour-glass stomach is found now and then in those who complain of the most varied functional gastropathies, and it is only too frequently that one hears these patients say that they can eat but small amounts of food at a time, or that they must stop eating during meals to prevent pain or even vomiting. When the beneficial action of atropine is seen in such cases, and its effect upon the x-ray picture, it becomes apparent that there must be some relation between autonomic stimuli and gastric neurosis. The recognition of their relationship is of particular diagnostic importance since symptoms similar to those found in these functional gastropathies are also found in gastric ulcers. Not only is this true but it is also true that both ulcer and neurosis may be found together.''

Cardiospasm and pylorospasm are frequently associated with general vagotonia. In fact it is claimed that a relationship to vagotonia has to be considered in all hyperkinetic gastric neuroses, especially as atropine so often exerts a favorable action. Furthermore, all those neuroses which are associated with increased gastric secretion are referable to stimulation of the vagal nerve supply of the stomach.

Intestinal disorders are extremely frequent. Almost on the border between normal and pathological are the light diarrheas with liquid stools in connection with some fear or excitement. From this mild phenomenon we have all transitions to the chronic neurogenic diarrhea first described by Trousseau. Belladonna preparations and adrenalin enemeta (20 to 30 drops of 1/1000 solution in 5 to 10 ounces of water) are often beneficial. The so-called peristaltic unrest of the small intestine manifested by noisy rumblings is of similar nature.

Mucous colitis in the narrower sense, without true membranous inflammation, is an intestinal neurosis in which an anomalous secretory activity exists in addition to the increase of peristaltic action. A similar condition, a diarrhea with a large amount of glairy, tenacious mucus, is produced in rabbits by the administration of pilocarpine.

Spastic constipation is a frequent finding in vagotonic individuals. ''Since atropine has a very favorable effect upon this condition, moreover, since spastic states in the circular colonic musculature are certain and spastic states in the rectal sphincter are known to play a part, we are inclined to attribute this disease to autonomic irritation. Several signs are necessary for a diagnosis of spastic constipation. These are: diminution in the volume of stool combined with diminished water content and perhaps increased resorption; spasm of the circular muscle and frequently an increased secretion of mucus in the stool. On casual observation it would seem foolish to ascribe two such opposite conditions as constipation and diarrhea to the same cause. We believe, however, that the same etiological factor is operative, only in one instance the circular, in the other the longitudinal muscle is affected. We find a similar state of affairs in the stomach, for here also spastic states and hypermobility are referable to the same underlying cause. At all events, the behavior of the nerves to the intestines is exceptionally complicated, due to the presence of the mesenteric plexus. Besides, an attempt should be made in each case to separate peripheral from central vagal stimuli. Many observations in pharmacological literature show that there may be important differences in this connection. The frequent occurrence of spastic constipation in vagotonia, the above-mentioned beneficial effects of atropin, and finally the not unusual transition from a spastic obstipation to a diarrhea, leaves this idea of its cause on firm ground. The complete comprehension of this disease must be left to further researches.''

Cardiac neurosis. According to the authors this is the hardest chapter of visceral neurology. We may postulate both a vagotonic and a sympathotonic cardiac neurosis. As an example of the former we meet cases of ''so-called neurasthenic cardiac weakness, in which, besides painful sensations in the neighborhood of the heart, there exist marked respiratory arrhythmia, even disappearance of the pulse during deep inspiration, cor mobile, dermographism, enlargement of the tonsils, Aschner's pressure phenomenon and asthmatic attacks with expectoration of a tenacious sputum containing Curschmann's spirals. In these cases the point of maximum impulse of the heart is heaving and pushed outward. It is interesting that in such cases atropine may relieve not only the respiratory arrhythmia, but also the high grade tachycardia, a symptom which does not seem to belong to the same group as the others.'' The authors also describe a ''vagotonic goiter heart'' due to the engrafting of a secondary thyroidism on a vagotonic constitution. The loss of pharyngeal reflex in cases of cardiac neuroses is considered a vagotonic rather than hysterical symptom. Moist cyanotic hands and feet also indicate vagotonia as there is evidence to show that the vasodilators are supplied by the autonomic nervous system.

Associated conditions. The lymphatic constitution and persistent thymus often exist together with vagotonia. Myopia, enteroptosis, palpable kidneys, narrow aorta and anemia are other common accompaniments, which leads the authors to this remark: ''When we discover that vagotonia is associated with so many other constitutional anomalies, which are manifestations of inferiority, we naturally are inclined to ask whether vagotonia itself is not a form of constitutional inferiority. That this view is true is strengthened by the fact that vagotonia is so frequently found in classes of people who show signs of degeneration, as for example Polish Jews.''

The clinical picture of various diseases may be modified by the existence of vagotonia. Thus, in tabes, visceral crises may then be more prominent, and in exophthalmic goitre we will have relatively slight increase in pulse rate, moderate exophthalmos, and absence of Moebius' sign, while Graefe's sign, sweating and diarrhea are marked, together with a tendency to gastric hyperacidity, eosinophilia and disturbances in the respiratory rhythm.

The so-called ''exudative diathesis'' in children described by Czerny, with its tendency to spastic states and convulsions, to vascular disturbances and exudations, is thought possibly to be but an infantile form of vagotonia. This theory is strengthened by Strümpell's assumption of a relationship between this diathesis and bronchial asthma.

Therapeutic considerations. The great remedy for the irritative and spastic states in vagotonia is *atropin.* ''It may be used to great advantage in bronchial asthma, in which small doses may be used without danger for many weeks. It should be given in doses of one to two milligrams (gr. 1/60 to 1/30) a day, subcutaneously. In the course of the treatment, this may be increased to three milligrams (gr. 1/20), after which the former dosage is resumed.

"Another group of conditions, in which atropin is very useful, is that relating to vagotonic gastric disturbances, gastric ulcer and hyperacidity, as well as gastric crises. The addition of atropin is often required when gastric disturbances follow the use of the infusion of digitalis. Atropin is also of great value in treating cardiac conduction disturbances, as well as the troublesome subjective symptoms of extrasystolic arrhythmias. The harmlessness of atropin demands that it be used more extensively than hitherto."

EPILEPSY.

The Nature of Epilepsy. That the problem of the etiology and cure for epilepsy is still one to be solved is shown by the large amount of speculation and guesswork, as well as by the less conspicuous but more promising serious investigation by men in various fields of medical research, all of whom are striving to achieve the immortal fame which will come to him who solves this problem of centuries. In many ways the history of epilepsy is as strewn with shattered theories and too hasty and flimsy conclusions as is that of hysteria. As examples of the widely differing ideas concerning epilepsy and its cure which continue to be offered to us we shall mention the following:

I. *Epilepsy a symptom of infection of the intestinal tract by a specific, probably gas-forming bacillus.* This theory is offered by the eminent Cincinnati surgeon, Charles A. L. Reed,[2] who describes how he gradually came to his point of view. About seven years ago he began the surgical treatment of constipation and in the course of this work he early encountered certain cases in which epilepsy occurred as a complication of constipation. He did not at first recognize it as having even a

---

(2) Jour. Am. Med. Ass'n., Mar. 27, 1915, Vol. 64, p. 1047.

probable sequent relation to the condition of the intestines which was demonstrably the cause of the constipation. It was in fact totally disregarded in such of these early cases as came to operation. The following three facts forced themselves to Reed's attention:

(1) All epileptics are constipated.

(2) Certain epileptics once permanently cured of their constipation cease to have epilepsy.

(3) While all epileptics are constipated only a relatively few constipated persons have epilepsy.

The third fact logically required the existence of another etiologic factor, the presence of which would account for the existence of epilepsy under given conditions in one case, and the absence of which would account for the absence of epilepsy under the same conditions in another case.

"In this connection the toxic factor that I had long recognized to be present not only in all cases of chronic constipation of mechanical origin, but especially in all epileptics, assumed a new and more potential significance. It was apparent, however, that while the general principle of toxicity obtained, there must be some definite or specific poison or toxin to account for the equally definite and specific phenomena presented in these cases.

"This view was held in mind in the further development of my surgical management of the perfectly obvious lesion presented in all of these cases, namely, mechanical interference with the normal activity of the bowels, the only lesion, by the way, which has been demonstrated in 100 per cent. of epileptics that have come under my observation. It so happened that I had treated all of my earlier cases by replacement and fixation of the colon after my method of retroperitoneal implantation. the details of which I have already reported. When I later incidentally ascertained that these patients, five in all, had been free from epilepsy following operation, for periods varying from seven months to more than three years, I was impressed, first, that the whole difficulty had been in the colon and, second, that the restoration of the fecal current had resulted in carrying off the poison, whatever its character. I then found a patient of whose epilepsy I had taken no account, but in whose case I had successfully operated for intestinal stasis four months before, but in which the epilepsy had only been reduced from grand mal to petit mal. In the light of this case it seemed to me that, considering the gravity of the disease and the obvious fact that the colon was the seat of the difficulty, the more logical procedure would be to remove the colon. I then did colectomy in my next two cases, both of which had grand mal, with a satisfactory surgical recovery in both instances. In both cases there was immediate cessation of the epileptic attacks. In one there have been two slight attacks of petit mal in the six months that have since elapsed. The other patient, who had had from one to four attacks daily before operation, left the hospital at the end of three weeks without having had a seizure. She continued well, her bowels moved freely several times daily, she ate well, and was up and about when, at the end of three weeks, she suddenly developed status epilepticus from which she died at the end of seventy hours. A necropsy revealed an acute dilatation of the duodenum as the only lesion. It was caused by traction exerted by and through the mesocolon from the weight of the rather heavy omentum that I had left after the colectomy. This taught me two important lessons, namely, first, what I had really known before, that the ptosic condition of the mesocolon, whether effected by the weight of a loaded colon or by that of a fat omentum or by both, could produce obstructive angulation of the duodenum, and second, that the specific poison of epilepsy, whatever its character, was elaborated in the duodenum—a conclusion which conforms to the general views of Bloodgood, Draper and others with reference to the duodenal origin of other and non-specific intestinal toxins.''

Reed then began to operate at two stages, the first being an anastamosis between the ileum and the sigmoid flexure (ileosigmoidostomy) and the second the removal of the colon. In this way two ends were accomplished. Some patients would only require the first stage and in those requiring the second stage the operative risk would be much less.

In his further observations the author was impressed by the "complete and surprising absence of the hereditary factor in all the histories." He also was unable to find any case of epilepsy caused by a head injury although he found numerous cases in which a fall or strain or other injury was the manifest cause of the splanchnoptosis present. He adds: "The old type of so-called 'idiopathic epilepsy' has of course gone the way of all idiopathic things, such for instance as idiopathic peritonitis, until the very word itself is on the index expurgatorius of all physicians with intelligence enough to know that every effect is the result of a cause."

"On the contrary, every phase of the disease seemed to emphasize the existence of a poison of intestinal origin. There were the hebetude and mental depression which always occur when there is hyperabsorption of intestinal toxins—the word toxin being here used in its new and restrictive sense of a poison of bacterial origin. There was the vertigo, often without, often with an instant of unconsciousness, but still vertigo, very similar to what healthy persons experience when they are 'bilious,' which is another word for torpidity and hyperabsorption. There were the convulsions, not entirely unlike those of tetanus, of known toxic origin, or not entirely unlike those produced by strychnin, a known poison. There was the dilatation of the pupils, not entirely unlike that which occurs in advanced toxemias. There was the high blood tension, something like that which occurs in the known acute infections. There was the temperature vacillation, less in range but still a vacillation, such as occurs in recognized septic states."

The interesting paper, which the author modestly calls a preliminary report, ends with the following conclusions:

"1. Epilepsy is caused by a specific infection, probably a bacillus of the gas-forming series.

"2. The infection is located in the intestinal canal, probably primarily in the duodenum, always finally in the colon, and may be superficial, intrafollicular or interstitial, or may, and in certain cases probably does, involve the blood as a propagating medium.

"3. The infection seems to be made effective primarily through constipation of mechanical origin.

"4. The relief of the mechanical cause of the constipation with restoration of bowel function results in the cure of epilepsy in cases in which the infection is probably superficial.

"5. The principle of immunization holds good in the treatment of cases in which the infection obviously lies deeper, in all of which autogenous vaccination may well be applied as a matter of routine."

II. *Epilepsy a manifestation of the imperfectly developed libido in persons of a psychosexually inferior makeup.* Just as Reed was gradually led to a new conception of epilepsy in perfecting his methods of intestinal surgery, so the distinguished New York neurologist, L. Pierce Clark,[3] passed through a similar mental experience, but in entirely different channels, as he was perfecting himself in psychoanalysis. Clark has been an earnest student of epilepsy and we have previously had occasion to refer to his work (Practical Medicine Series, 1913, Vol. X, p. 10). His present views are thus stated:

"In this study it is contended that neither the present accepted pathological anatomy of marginocortical gliosis nor its postulated pathogenesis, a still earlier chemicotoxic state, is really sufficiently constant in variation and extent to account for essential epilepsy; that one must seek for an alteration in some more fundamental process of life, absence of which shall be sufficiently dynamic to cause the mechanism of the epileptic fit in all cases of the genuine disease; that a definite defect in the emotional or affective side of the mind in epileptics is constant though variable; that the fit is a striving for expression of the libidinous energies in the unconscious; that the fit is therefore a libidinous outlet of the primal sexual energies and should be considered as essentially a pathological functioning of the unconscious; that this state is due to a condition of mental infantilism caused by or coincident with a libidinous fixation in the earlier stages

---

(3) New York Med. Jour., Feb. 27, 1915.

of psyschosexual development of the epileptic; that the most constant fixation defect is one of more or less rigid attachment to the parent of the same sex as the epileptic himself; that other libidinous objects of attachment or fixation may be shown at the same time to be narcissistic and homosexual; and that the prognosis and treatment of the malady should be based upon the strength of the primary, secondary, and tertiary libidinous energies, and upon how far they may be made to assume a proper normal direction of development in sublimation.''

How attacks even of a so-called focal or Jacksonian character may not baffle the psychoanalyst is shown by the following case:

''A young man, twenty-three years old, who had grand mal epileptic attacks since thirteen years of age, was typically epileptic with the epileptic constitution and its psychosexual infantilism. His attacks were peculiar in that the initial spasm invariably began in a flexion spasm in the left hand and arm. It was accompanied also by a turn of the head to the same side; after which the spasm became general over the entire body attended by complete loss of consciousness, often accompanied by tongue biting and passage of urine. There was no apparent neurological reason for the focal onset of the attack. In more minute study of the developmental life we find that the patient slept with the mother until he was nearly thirteen years of age. He was a 'mamma's boy' of a pronounced type and has not lost these salient characteristics yet. It was found that from earliest life he slept on the right side of the mother's bed, the wall of the room was at his right, yet he always had a dread that some one would reach through the wall in the dark and drag him backward. Even though he entwined his left arm under the mother's right, turned his head sharply toward her to the left, and pulled the blankets nearly over his head, he still had the dread. At thirteen years of age, he was completely banished from this childish contact with the mother. He went to sleep with the older brother, who took entire charge of him. His fears increased, although he made a slavish transference on this brother. He practised the same conjuring tactics to avoid the fear in the brother's bed that he had with the mother, but of course with less satisfactory results. Soon his epileptic attacks appeared and were of the type of motor petit mal, confined to the head turning to the left and a spasm in the left arm; in a year or so they became general and his condition has been repeatedly diagnosed as a confirmed epilepsy.''

Another quotation shows how far the author is willing to go:

''Furthermore, in the dreams and in the beginning of the fit, there is a slight sense of suffocation, a sense of being bound or bundled in, of being folded about and floating away in space, of freedom, and a sense of the utmost security. Both the dreams and the pieced together sensations in the attacks bring him to the same place—a close, shut in, safe place where he is at peace from the world, and where he is quite *en rapport* with his lot. Such a haven can hardly be other than an unconscious return to the mother life. It is interesting to note the infantile striving in these dread neuroses, and the epileptic unconscious strivings are probably more intense than simply a desire to be caressed by the mother in the cradle, the mother's arms, or lap. The state of oneness desired is to be actually in the mother, and the physical union of the intrauterine life is really sought. (The desire was still strong even though the patient was in bed and was already in actual contact with the mother there.) A single case of this sort must fully convince us that the final depth of the unconscious strivings in such epileptics is often to return to the nirvana of the uterine life, a state of perfect *Allmacht*. Classic literature abounds in the often described attacks of actual epilepsy in historic personages in which they are 'caught up into heaven,' which state seems familiar enough to them—where 'they have often been before' and where there are all the perfect settings of peace, etc. See descriptions of the epilepsy of St. Paul, Mohammed, Dostojewsky, Mother Ann Lee, etc. Similar descriptions in everyday clinical experience are so common as to cause wonder that the whole libidinous satisfaction of the unconscious striving in the fit has not been long ago detected.''

"The cry of the epileptic is more than a simple expiratory act of forcing air through the partly closed glottis. To some observers it spells despair; to others it is not unlike the bellowing rage of cattle; to still others it is an indescribable mingling of joy, surprise, and hate. It is really closely comparable with the piercing, persistent, high pitched tone of pain, the whimpering, plaintive note heard from the infant when in an uncomfortable posture; at times it has the loud, blatant, noisy cry, rising to unexpected intensity, given by the child experiencing a cold bath. The two cries appear to be the more identical in motivation when one discounts the modifying influence which growth has brought about in the adult epileptic. That the motivation of these cries in the child and the epileptic is instinctive and impulsive may be shown, in part at least, by the impossibility of our being able fully to reproduce either in mimicry."

When in an attack the adult epileptic turns his mouth to the side and upward and backward, then, according to Clark, he is "in phantom pursuit of the mother's body," like the infant "it turns its head from displeasure and toward the mother's breast."

Clark's views lead him to the following statement regarding treatment:

"From all of the foregoing, one is impressed that the real treatment of epilepsy is analytical, educational, hygienic, dietetic, and medicinal. The prime importance of removing the epileptics from home influences and surrounding them at once with a normal environment is only too obvious. (All through the text I assume to speak for the average youthful epileptic of fair intelligence and uprearing.) It is impossible to obtain proper and full development of even a normal youth if he goes to a college in his own city and dwells at home; how much less, therefore, is it possible to break down the infantile attachment in the epileptic neuropath under the constant associations of home influences, with those either neurotic themselves or who openly contribute to neurotic continuance in the epileptic patient! Likewise one sees the necessity of making the environmental setting and companionship of such a simple kind that it shall fit the individual case. The developmental process can thus be properly gauged and advanced as fast as the individual epileptic is able to take on more sublimation of his libidinous energies. The type of life demanded in heterosexuality can probably never be rightly attained for the epileptic, though he may even grow up normally and rid himself of his disease. He must learn to sublimate his energies to the neighborhood realm of his emotional make up. To permit him to strive to an unattainable biological level is cruel. We can now appreciate the rôle which baths, packs, massage, colon irrigations, and nonprotein diet or a somewhat limited, properly balanced one, play. The whole bodily training is but a help to a better physical vigor. At the same time the physical exercises let off the storm and stress of a naturally restless and overactive libido. A sublimation into useful interesting occupations is to be aimed at.''

Eight cases are related in detail and each one interpreted from the Freudian viewpoint.

The Hereditary Relationship Between Epilepsy and Alcoholism. Unlike Reed, whom we quoted above as finding no hereditary factor in epilepsy, other authors believe themselves able to furnish statistical evidence of the rôle of heredity. However, it is true that direct heredity is uncommon and it is only by including a large group of various morbid conditions which, more or less arbitrarily, have been assumed to have a relationship to epilepsy and to enter into what the Germans call ''Belastung'' that the evidence appears formidable. Recently J. Stuchlik[4] gave the statistics of the psychiatric clinic of Zurich from 1870 to 1913. Of 12,600 patients, 341 or 12.7 per cent. were epileptic. In 97 patients no history was obtainable and in 68 cases all relatives were said to be healthy, but the statements were rather vague. Of the remaining 176 cases with complete data, 20 gave an entirely negative family history. It is interesting to peruse the list of disorders which are included as factors in the hereditary burden, ''Belastung,'' of the epileptic: Alcoholism, epilepsy, migraine, hysteria and neurasthenia, mental diseases, imbecility and idiocy, organic

---

(4) Cor.-Bl. f. schweiz. Aerzte, 1915, Vol. 45, p. 70.

paralysis, apoplexy and senile dementia, tuberculosis and pulmonary diseases, cancer and chronic diseases, syphilis, suicide, deafmutism.

On this liberal basis 63 per cent. of all epileptics showed hereditary factors but this figure is considered too low on account of the unreliable data in the 68 cases and because other investigators reached higher percentages (Finck 70 per cent., Dejerine 87 per cent.). The author analyzes his material very thoroughly and arrives at the following conclusions:

1. Epilepsy itself in the ascendency plays no great rôle, as in only 6.4 per cent. were any ancestors similarly affected and epilepsy in other relatives was present in only 9.5 per cent.
2. Hysteria, dementia praecox, periodic insanities, imbecility, organic psychoses and general bodily diseases are still much less important in the family history than epilepsy.
3. In the presence of strong hereditary factors the attacks seem to appear earlier.
4. Quantitatively, alcoholism is the most important hereditary factor. It constitutes nearly 30 per cent. of all the factors. Forty per cent. of all patients with defective heredity had alcoholic parents.
5. In 50 per cent. of the cases with alcoholic parents the family history was otherwise negative.
6. In the families of epileptics without alcoholic parents alcoholism plays an unimportant rôle.
7. Our figures, though small, make it extremely probable that alcoholism in the parents of epileptics is not merely the expression of a family disposition both to alcoholism and to epilepsy but also that alcoholism in the parents is an important cause of epilepsy.

Treatment by Partial Compression of Both Common Carotids. Joseph Rilus Eastman[5] has revived the idea expressed many years ago that ligation of the carotid or vertebral arteries ought to have a favorable effect upon epilepsy. Alexander of Liverpool ligated the vertebral arteries and at first the results seemed to be excellent. [It should be a warning to all originators of

---

(5) Amer. Jour. Med. Sci., Sept., 1915, Vol. 150, p. 365.

new methods of treatment for epilepsy, whether along lines of brain surgery, abdominal surgery or psychoanalysis, that a temporary cessation of attacks frequently seems to result from the institution of any new treatment which causes the physician to keep the patient under close observation for a given time. Perhaps the attendant improved general hygiene may partly explain this phenomenon.—Ed.] As not unusual, the method was later found to be without value and it was suggested that the vertebral arteries after all play an unimportant rôle in the blood supply of the brain. Jonnesco's operation of section of the cervical sympathetic was partly designed for the purpose of influencing the circulation of the brain as it was thought that the cervical sympathetic nerves contained vasomotor fibres for the head. Delegeniere reports excellent results following ligation of the superior longitudinal sinus. However, Eastman's review of the literature shows the lack of a sound basis for these attacks on the circulation of the head as there is no agreement among those supposedly best informed as to the actual state of the cerebral circulation before and during an epileptic attack. Thus, Turner thinks there is a sudden stasis; Bechterew believes there is an increased flow of blood to the brain and a temporary dilatation of the capillaries during the attack; while Leyden and Sommer believe the exciting cause of the attack is anemia of the brain. The former observed epileptic attacks in cases of aortic stenosis and attributed them to a temporarily insufficient blood supply; the latter observed their occurrence in a case of ankylosis of the atlas causing narrowing of the vertebral canal. [The reader will have to decide from this evidence whether it is good or bad for the epileptic to have the flow of blood to the brain restricted.—Ed.]

Momberg[6] accidentally saw an epileptic in the street and it occurred to him to apply digital compression to both carotids. The man drew a deep breath, opened his eyes and appeared conscious; while he was being carried into a house the convulsions reappeared, the compression was repeated and the convulsions ceased. Similar obser-

---

(6) Deutsche Med. Wochenschr., April, 1914.

vations have been made by others and on the basis of this experience Momberg in February and March, 1914, operated on two cases. He compressed both carotids by twisting the crossed ends of a silver wire loop until the temporal pulse became barely perceptible. In his article which was printed in April, 1914, both cases were reported as distinctly improved. Eastman points out the worthlessness of such a hasty report but he was sufficiently impressed with the theoretical basis of Momberg's operation to perform it in six cases between the months of August, 1914, and March, 1915. In three of the cases the severity of the attacks was reduced and the author states that "in view of the extremely unsatisfactory results of non-surgical treatment of general epilepsy the practice of the plan of compression of the common carotids may be considered justifiable though the procedure at present should be regarded as an experimental one."

MIGRAINE.

The Paralytic and Other Persistent Sequelae of Migraine. Migraine, though exceedingly common, remains one of the least understood of all human diseases. Some sidelight on the affection is thrown by the not unusual transient complications of a focal character, such as scotoma, hemianopsia, ophthalmoplegia, aphasia or hemiplegia. These complications, and particularly those rare ones of a persistent character, have been made the subject of a thorough study by J. Ramsay Hunt,[7] who begins by stating that they are generally regarded as manifestations of vascular spasm, and continues:

"The paralytic and other permanent complications of migraine may appear in various forms, viz., as ocular palsies (*migraine ophthalmoplegique*), organic hemiplegia with aphasia, hemianopsia, and optic atrophy. A recurrent facial paralysis has also been ascribed to migraine (*facioplegic-migraine*), presumably of the same nature and having the same pathogenesis as the ophthalmoplegic type of this affection. The object of

---

(7) Am. Jour. Med. Sci., Sept., 1915, Vol. 150, p. 313.

this study is to record my personal experience with a comparatively rare group of cases, and to emphasize the clinical fact that migraine, which is usually so harmless, may on occasion be the cause of serious and permanent sequelæ."

Migraine and ophthalmoplegia.

Case I. Summary. Migraine in a woman, aged twenty-five years; following typical unilateral headache, developed complete paralysis of the left third nerve; recovery. One year later another migrainous seizure, followed by incomplete palsy of the right third nerve; recovery.

Case II. Typical migraine since childhood; at the age of forty-three years had an attack of complete third nerve paralysis, with recovery; a subsequent attack which proved fatal; cardiovascular complications.

Cases III and IV. Summary. The occurrence in two sisters with migraine of isolated abducens palsy developing during the attack; recovery.

The author's comments on the two latter cases is as follows:

"These cases are of unusual interest on account of the extreme rarity of this ocular complication, and because of its occurrence in two sisters, in both consequent upon a migraine paroxysm. Such a familial coincidence is, I believe, unique, and would speak for the joint inheritance of a highly specialized type of this disease or of some vascular anomaly. It is significant that both cases had passed the middle period of life and had reached the age when organic vascular changes are likely to appear. Under these conditions a certain vascular distribution which for many years had been subjected to periodical spasms, with only functional disturbances, might at last, because of diminished caliber or elasticity of the vessel wall, give rise to organic changes from too prolonged obstruction of the blood current. It is interesting to note that in addition to the age factor, both sisters had been subjected to unusual worry and strain consequent upon the illness and death of a parent. The exact localization of the lesion in such cases is difficult to determine. The theory of a neural origin finds most favor, caused either by pressure or traction from swelling of the surrounding parts or by prolonged spasm of the vasa nervorum with consecutive ischemic degenerative changes in the nerve."

Ophthalmoplegic migraine was first described by Moebius as periodic oculomotor palsy and by Charcot as *migraine ophthalmoplegique.* Two clinical types are generally recognized: (1) A recurrent or periodical ocular palsy followed by complete recovery; (2) Periodic exacerbations of a preëxisting paralysis of some of the branches of the third nerve. Some cases belonging to the second group have come to autopsy and a variety of lesions has been met with such as fibrosarcoma and neurofibroma compressing the nerve. Shinoya[8] reported a case with a history of periodic oculomotor palsy beginning at the age of 6 years; between the attacks remnants of the paralysis persisted. Post mortem examination showed a fibrous-like swelling on the right third nerve situated just behind the posterior cerebral artery. It is pointed out that the third nerve passes between two arteries in its course at the base of the brain, namely the posterior cerebral and the superior cerebellar, and that this may account for the very curious predisposition of this nerve to such lesions. Cushing has also called attention to the possibility of vascular pressure and constriction as a cause of the neural complications of migraine.

Migraine and permanent hemianopsia.

Case V. Summary. A man aged forty-four years, had suffered from migraine since childhood; after a typical attack there developed a right homonymous hemianopsia, which persisted.

Comment. "The character and periodicity of the headaches in this case are typical of migraine. For one year previous to the development of hemianopsia he had noted during the attack a transient sensation of numbness and heaviness in the right hand which had never occurred previous to this time, and may well be con-

---

(8) Deutsch. Zeitschr. f. Nervenh., 1911, Vol. 42, p. 155.

strued as a warning symptom of the subsequent vascular lesion. Immediately following a typical attack he awakened to find the hemiopic defect in the right field of vision, which has persisted. This was the only residual symptom of the attack, and indicates a lesion of the visual mechanism in its course behind the optic chiasm. As there was no haziness or darkness in the blind area, as usually occurs in lesions of the optic tract and chiasm, it may be assumed that the lesion was posterior to the primary optical centres, probably in or near the cortical area for vision. The absence of the hemiopic pupillary phenomenon is also in favor of a central and not a peripheral localization of the injury. The manner of development is strongly suggestive of thrombosis.''

Case VI. Summary. Severe migraine since childhood; at the age of forty-five, during an attack, developed a left homonymous hemianopsia lasting ten days, followed by recovery; eight months later a second attack, which was persistent; mitral disease.

Migraine and hemiplegia.

Case VII. The patient, a single woman of 32 years, has been subject to migraine since childhood. Her mother and other members of the mother's family have been similarly affected. The attacks are typical in nature, the pain being most severe in the occipital region, and they usually terminate with nausea and vomiting. In 1912, after a severe attack, she was taken to the New York hospital in a semiconscious state and was seen by Dr. Hunt, who found a distinct paresis of the left arm and leg and of the left side of the face. The abdominal reflexes were absent on the left side while a Babinski sign was obtained on both sides. Lumbar puncture showed the presence of fresh blood in the cerebrospinal fluid. The Wassermann test of the blood and cerebrospinal fluid was negative.

At the end of twenty-four hours the stuporous condition diminished and was replaced by a restless delirium. She had at no time any convulsive seizures. As the mental condition improved it was noted that in addition to the left hemiplegia there was also hemianopsia upon the left side. At this time an ophthalmic examination showed a slight degree of optic neuritis, a little more pronounced in the right than in the left eye.

Her mental condition gradually cleared and the hemiplegia and hemianopsia gradually diminished and she eventually made a complete recovery.

Comment. "The diagnosis in this case was at the time and still is somewhat doubtful. The complete recovery is in favor of a vascular lesion. There is no question as to the existence of migraine in this patient, and of a strong family tendency to this disease. There seems also very little doubt that the apoplectiform seizure was the culmination of a severe migrainous paroxysm, and while there may have been some preëxisting vascular or other organic defect of the brain structure, the determining rôle played by the migraine explosion seems to have been a perfectly definite one."

Migraine and lesions of the optic nerve.

Case VIII. A woman, aged 31 years, subject to migrainous seizures since childhood; after a severe attack she developed a unilateral retrobulbar neuritis with paracentral scotoma; recovery.

Comment. "This case is recorded because of the apparent relationship of unilateral retrobulbar neuritis to a migraine paroxysm. Such a sequel is not recognized by systematic writers on this subject.

"Oppenheim, however, states that he 'once observed a patient with migraine who developed an optic neuritis with paracentral scotoma, and although the casual relationship may be doubtful, it is well to bear in mind the probability of such a complication.'

"Other migraine complications referable to the optic nerve are, however, definitely recognized. For example, Voss has observed unilateral optic atrophy after the attack in a woman who had reached her forty-second year. She had been subject to hemicrania since childhood, and following a severe attack became suddenly blind in one eye. This was caused either by hemorrhage into the optic sheath or thrombosis of the central artery of the retina. Galezowski has also observed thrombosis of the central artery of the retina from a similar cause. In this connection it is of interest to note that hemorrhages into the retina and detachments of the retinal membrane have occurred during the migraine paroxysm."

Among the concluding remarks of the author are the following:

"Without reviewing in detail all the theories which have been formulated in explanation of the symptomatology of genuine migraine, it may be assumed that there is periodical recurrence of an autointoxication, the chief effects of which are experienced by the sympathetic and vascular systems. As a result of this there is induced a condition of more or less localized vasomotor spasm or vasomotor dilatation of the cerebral circulation (angiospastic and angioparalytic types of migraine).

"Some idea of the degree of vasomotor disturbance to which the cerebral vessels are subjected may be surmised from the results of ophthalmoscopical examination of the retinal circulation during the attack. At such times there has been frequently noted a marked pallor of the optic nerve and retina, from contraction of the vessels, which gradually disappears with the subsidence of the seizure. The fluctuations in the size of the temporal artery during the paroxysm are so well known as scarcely to require mention.

"It would seem reasonably safe to assume that what occurs in the distribution of the ophthalmic and temporal arteries may also occur in other regions of the cerebral circulation, and this vascular spasm is regarded by most observers as the cause underlying the transient focal symptoms so frequently associated with this disease, viz., scotomata, paresthesiæ, paresis of the extremities, and aphasia, all of which disappear with the subsidence of the spasm.

"Another important and interesting question is the etiological relationship of hemicrania to premature cerebral arteriosclerosis. Some writers maintain that the frequent recurrence of vascular explosions in migraine over a period of many years are in themselves sufficient to cause cerebral arteriosclerosis. The autointoxication which is the underlying basis of the disease is also recognized as a probable contributing factor.

"Of great importance from the standpoint of the permanent sequelæ such as are described in this paper is the question of the influence of recurring attacks of migraine upon an already existing arterial sclerosis. It is very evident that in the presence of cerebral arteriosclerosis, however slight, the crises of hemicrania are much more likely to be the cause of vascular accidents, such as thrombosis and hemorrhage than would be the case in perfectly normal vessels. It is this combination of factors which would appear to be the important one in many of the cases which have just been described.

"Another element which must be considered is the possibility of arterial anomalies in the blood supply of the brain and cranial nerves which might render a certain arterial distribution especially vulnerable in the event of sudden vascular spasm."

RAYNAUD'S DISEASE.

Oliver T. Osborne[9] reports 11 cases and discusses the disease briefly and lucidly. The grades of severity are as follows:

"1. It may be so mild as not to be recognized. Such patients have cold hands and feet, irregular pains in various parts of the body, and they are cold in winter and hot in summer (vasomotor ataxia, as it is termed). There may be so much contraction of the peripheral blood-vessels that the internal vessels, especially the abdominal, are dilated, and frequently diarrhea is caused, sometimes termed 'intestinal sweating,' from which cause a patient may have a morning diarrhea without other symptoms. Or there may be such abdominal congestion as to cause various other gastrointestinal disturbances, albuminuria, etc. This kind of congestion or spasmodic contraction of blood-vessels is probably often the cause of ovarialgias, delayed and painful menstruation, and menorrhagia.

---

(9) Am. Jour. Med. Sci., Aug., 1915, Vol. 150, p. 157.

"2. There are cases of medium severity in which there are ice-cold hands and feet, chilblains of varying degrees, sore fingers and toes, suppurations around the nails, perhaps severe headaches, and there may be erythromelalgic symptoms of red face and red hands, with or without pain. There may be faintness or syncope, dizziness, some slight nervous disturbances, as of the eyes, and recurrent albuminuria or hematuria. This condition may be one of the causes of albuminuria of adolescence and of orthostatic albuminuria.

"3. Severe cases, occurring less frequently, in which there may be serious heart disturbances, deep ulceration of the fingers and toes, serious cerebral symptoms, or severe abdominal symptoms.

"4. There may occur, very rarely, such serious and uncontrollable spasms of the blood-vessels as to cause gangrene and sloughing of parts of the extremities. It is also conceivable that fatal heart attacks may be caused by this syndrome."

"Conclusions: 1. Raynaud's disease is not a distinct entity; it is a syndrome caused by the disturbance of one or more internal secreting glands.

"2. There is primarily no real disease of the blood-vessels, but the vasomotor control is so abnormally disturbed that most profound contraction of certain blood-vessels may occur in different parts of the body, perhaps more or less coincident with abnormal dilatation of other blood-vessels. If the contracted blood-vessels are peripheral, the parts more or less lose their function and show various trophic disturbances.

"3. This blood-vessel spasm may occur in the internal organs of the body as well as peripherally, though much less frequently and more difficult of diagnosis.

"4. The syndrome is probably due to disturbances of more than one of the ductless glands of the body that have internal secretion, but there is always apparently some disturbance of the thyroid gland, perhaps a diminution of the vasodilator stuff of this gland.

"5. Judiciously applied, thyroid treatment improves the majority of cases, perhaps all, and cures some cases. Nitroglycerin is always of temporary benefit and local heat is always of immediate benefit."

PSYCHOANALYSIS.

The Ethical Aspects of Psychoanalysis. John T. MacCurdy[1] concludes an article on this subject with the following statements:

"Finally a word as to the value of the knowledge of psychoanalytic principles to the individual and the community. In the first place they force us to honesty of thought. No one can successfully analyze another who does not *pari passu* analyze himself, for if he be struggling against some unconscious tendency himself, he is not liable to recognize the transient suggestions of its operations in others. He learns, therefore, to examine his own opinions and attitudes. If he finds that he holds some view more strongly than his neighbors, he realizes that it must have some vital unconscious significance; this attitude once gained, he is free to examine it objectively. No one who knows that all our activities represent conscious or unconscious self-indulgence, can shield his conscience with the plea that his action has an altruistic motive. He must look beneath the surface and see toward what result his action tends. For example, the parent who spoils his child is convinced that he is sparing it pain when he withholds discipline. This is true, but his real motive is a selfish one; he is avoiding the pain it causes him to see one suffer whom he loves. Let him but realize that, and he is prepared so to treat his child as to spare it as much life-long suffering as education can protect it from, irrespective of what temporary sorrow discipline may bring.

"Secondly, psychoanalysis gives us not an infallible but a general method of gauging the sanity of conventions and laws. The analyst knows two things: First, that an extravagant effort at repression denotes an unusually strong unconscious tendency, for instance, that prudery implies a crude unconscious immodesty; second, that repression finds its expression in laws and customs

---

(1) Bull. Johns Hopkins Hosp., May, 1915, p. 169.

before it is an integral part of the individual's life. As an example of this, we may mention the elaborate systems of tabu and exogamy among primitive peoples which are directed against incest. With us such tendencies are so soon relegated to the unconscious that incest is, relatively speaking, an unknown crime. Many of our conventions are as ridiculous as tabu, though not so extensive. The analyst sees in conventions and laws the effort of society to protect itself; but, because he sees plainly that against which they are directed, he can also see their extravagances. He remembers that, though their general purpose is good, their form is artificial and that each generation is dominated by the customs of those preceding. Tabu makes family and industrial life, as we know it, impossible. Think of the pass we have come to in America, from our prudery, with our white slave traffic and our inconsistent divorce laws! When a knowledge of psychoanalytic principles has become general, our laws will correspond to the moral sentiment of the community. They will be laws that can be enforced, as they will represent the aspiration of the community rather than the extravagant, hysterical repressions of the law-makers, who satisfy their consciences by making illegal what they most want.

''Let us sum up this critique of psychoanalysis. We have seen that certain of its features have aroused antagonism without and caused dissension among its disciples. These teachings are seen, when critically examined, to be true, and we have accounted for their non-acceptance by their exciting an emotional hostility. This emotion is due, we think, to the fact that psychoanalytic doctrines arouse moral repugnance, a fact which forces us to see whether the ethical aspects of this new science are good or bad. We find that when rightly viewed these theories teach us that man has an inherent morality stronger than we suspected, and that he has succeeded in transforming his lowest, most selfish tendencies into work for the betterment of his kind. Finally we see in psychoanalysis the promise of a more honest form of thinking, not only in the individual, but also in the community. Its very basis, therefore, is ethical; an emotional misconception accounts for the opposition it has earned. Psychoanalysis is a new science; some of its formulations may be temporary; the conclusions of some of its adherents may be hasty and crude, and, in so far as they are crude, incorrect. But as to its basic concepts, we feel confident in saying that, rightly understood, they can have no opponents."

THE CEREBROSPINAL FLUID AND DISEASES OF THE MENINGES.

Factors of Influence in the Origin and Circulation of the Cerebrospinal Fluid. Charles H. Frazier and M. M. Peet[2] call attention to the great importance of arriving at a better understanding of the physiology of the cerebrospinal fluid in health and disease. They relate the history of the evolution of our knowledge concerning the fluid and state that it is now generally accepted that it is secreted by the choroid plexus of the ventricles. The authors performed numerous experiments for the purpose of clearing up some disputed points. Their experiments mainly consisted in studying the following features:

1. The artificial production of hydrocephalus.
2. Normal cerebrospinal pressure and variations due to circulatory changes.
3. Normal rate of secretion and influence of circulatory disturbances.
4. Rate and mode of absorption under normal and pathologic conditions.

A résumé of their results follows:

"The problem of absorption and secretion has been elucidated somewhat by the production of artificial hydrocephalus, so that it can be demonstrated without question that the cerebrospinal fluid is almost, if not entirely, secreted within the ventricles, and that absorption does not take place until the fluid has escaped. The lateral ventricle, therefore, is, as the bladder, merely a receptacle for the storage of fluid. Compar-

---

(2) Am. Jour. Physiol., 1914, Vol. 35, p. 268.

ing the results of phthalein injection with and without obstruction of the lateral ventricles, it has been possible to elaborate a method for the differentiation of different types of hydrocephalus from the standpoint of etiology.

"The cerebrospinal pressure has been found to vary with the pressure of the venous sinuses and to be practically identical with it. Under normal conditions there are certain oscillations, which are due to the effect of inspiration and expiration upon venous pressure, but they may be arrested by slight increase of intracranial tension. Closure of the carotid circulation causes an immediate but only transitory fall of cerebrospinal pressure, but obstruction of the venous circulation is followed by an increase in pressure more or less constant.

"The normal rate of secretion was found to vary widely under normal conditions and was practically uninfluenced by such profound circulatory disturbances as complete closure of both common carotid arteries. The propriety of ligation of the common carotid arteries, recommended and practiced in cases of hydrocephalus, has not been established by exact laboratory methods.

"The absorption of cerebrospinal fluid is largely by the venous channels. Lymphatic absorption is roundabout, slow, and relatively diminutive. By the phthalein test, it was proven that from 50 per cent. to 60 per cent. is absorbed within two hours. Within two minutes of an injection of phthalein into the lateral ventricles, the drug may be recovered from the blood in the torcular herophili. Absorption was found to be chiefly via the venous channels so that obstruction to the venous outflow is immediately followed by a rise in venous pressure, by the accumulation of cerebrospinal fluid, and a resulting increase in intracranial tension."

Cerebral Edema. According to Edmund M. Baehr[3] the syndrome consisting of delirium, convulsions and coma is caused by edema of the brain, and there is no essential difference in the symptomatology whether this condition occurs as a complication of alcoholism, diabetes, kidney disease or some infectious disease.

---

(3) Lancet-Clinic, Dec. 26, 1914.

"No matter what may be the exciting cause the symptoms will be of the following:

"1. *Altered mental states,* characterized by restlessness, headache, giddiness, noisiness, talkativeness, unnatural excitability and mild delirium which may increase to the wildest mania accompanied by hallucinations and delusions; or by the opposite of these, increasing moodiness or a lethargy which may become a stupor.

"2. *Convulsions,* which may appear after these prodromes, but just as often usher in a series of rapidly repeated fits which terminate in recovery, paralysis or death.

"3. *Coma,* varying in depth to the profoundest and usually ending fatally.

"4. *Impairment of the fundamental mechanisms of the medulla,* resulting in alteration of breathing, such as paroxysmal or continuous dyspnea and Cheyne-Stokes rhythm; alteration in the rate and regularity of the heart action, and such gastrointestinal phenomena as vomiting and diarrhea."

The author reports a number of cases for the purpose of illustrating his idea that a disturbance is exactly the same whether caused by infection, alcohol, diabetes or pregnancy. In each case a similar alteration of the brain functions is produced although the exciting agent differs.

"What are these agents? We know very little about them, nevertheless, we surmise that they are included among the following: Alcohol, ether and chloroform, and other lipoid soluble substances; bacterial toxins and the toxins due to faulty metabolism (acetone series) and pregnancy. Such substances in the circulation come in contact with every tissue of the body, and it is not unlikely that all are injured. The affinity, however, is between them and the sensitive and delicate colloids of the kidneys and the brain. In 1912, Martin H. Fischer showed that the colloids of the central nervous system behaved exactly as all protein colloids behave when influenced by acids. (The Absorption of Water by Nerve Tissues, Martin H. Fischer, Kolloid, Zeitschr., Vol. 10.) Which means to say, that the tissues of the nervous system swell and become cloudy and go into solution in just the same fashion as the kidneys. And in accordance with the same law they will reverse these processes in large part in the presence of salt and alkali. As a matter of fact, there is a curious parallelism between the behavior of kidney cells and brain cells under the same conditions. Similar anatomical phenomena, cloudy swelling, occur in both organs. They have been seen clinically and produced experimentally. Similar functional changes occur. There is the long-continued, low-grade disorder of the kidney, which does not seriously interfere with its essential efficiency, similar to the delirium of the impaired brain which may continue for weeks and months without producing irreperable damage. On the other hand there may be severe destructive alterations of the tissues of both organs resulting in complete suppression of urine in the one case and coma and death in the other. Severe involvement of either one of these organs may be temporary or permanent, depending on the nature of the exciting cause. The parallelism may be carried further. In the brain as in the kidney we are familiar with alterations of a more slowly developing type resulting from vascular disease. Thickening of the kidney arteries with the ensuing damage has its counterpart in the thickening and impairment of the arteries of the brain, and it is my private opinion that they are very usually due to the same cause.

"Finally, in each instance the organ is enclosed in a rigid casement which restrains swelling, thereby choking off the blood supply of the organ. Release of the cerebrospinal tension by spinal puncture permits the restoration of function in exactly the same manner as it is brought about in a choked kidney by splitting the capsule."

The author discusses and rejects the theories that uremia is caused by retention products, by "nephrolysins" and "nephrotoxins" or by disturbance of some internal secretion of the kidneys. To him the only satisfactory theory is that of Traube, of localized edema of the brain, which is fully corroborated by the work of Martin Fischer.

"The whole syndrome of uremia, in fact, is due to physicochemical changes in the brain colloids brought about by the influence of some toxic body. This body may be of an acid nature or it may be some subtle bacterial toxine, but it is not a substance produced by metabolism and retained in the circulation because of inefficient kidney action or even abolished kidney action. One agent is responsible for all the damage; at times it hurts the kidneys alone, at others the brain, and it is only when this occurs that we have uremia."

Cerebral Edema (Wet Brain) in Chronic Alcoholism. According to C. E. Sceleth and Arthur F. Beifeld,[4] the so-called wet brain of alcoholism was first recognized by Dana and later described at some length by another American author, Lambert. In their work at the House of Correction hospital, Chicago, the present authors observed some 2500 cases of alcoholism annually.

"Wet brain, dissected out from the network of alcoholic complications and sequelæ regularly associated with it, is definitely delimited in nearly every respect, particularly as to classification, symptomatology, and prognosis.

"Our view as to its place in the phase of chronic alcoholism has undergone change from time to time. Certain etiological factors deserve emphasis: (1) the longer the history of alcoholism and the more frequent the attacks of delirium tremens the more likely is the patient to develop wet brain, and one attack predisposes to a second; (2) some patients regularly go over into the wet-brain state from each attack of delirium; (3) cerebral edema always follows, never precedes, delirium tremens; (4) an unambiguous instance has never come under our observation, of edema occurring independently of an immediately preceding delirium, though Dana mentions the possibility of such an occurrence.

"The close relationship to delirium tremens is evident, but whether wet brain is a sequela of *mania a*

---

(4) Am. Jour. Med. Sci., June, 1915.

potu, an equivalent of the same, or an independent phase of chronic alcoholism has not been an easy problem to solve. We are strongly of the opinion, however, that delirium tremens in its classic form and wet brain represent merely successive time events in the alcoholic cycle, and that the pathological condition, wet brain, might aptly be called, clinically, comatose delirium tremens."

After discussing the symptoms of delirium tremens the authors state:

"The transition from delirium to edema is fairly well marked. Striking is the semicoma succeeding the active delirium. The latter is now of a low muttering type, the individual lies with his eyes closed and is aroused with difficulty. Supraorbital pressure and rubbing of the knuckles briskly over the chest in the mid-axillary line bring about a momentary lifting of the stupor, but questions will not elicit intelligent answers. During the early stages he will swallow food and still retain consciousness enough to have delusions and hallucinations resembling a low typhoid delirium. The pulse is rapid and weak; the temperature elevated a degree or more. Conjunctivitis is common, the tongue and teeth are sordes-covered, the breath is foul, and albumin is usually present in the urine.

"The train of symptoms peculiarly indicative of wet brain are essentially those of meningeal irritation and of cerebral compression. Hyperesthesia is one of the most marked and constant features; the integument is ultrasensitive, and pressure on the muscles causes the patient to grimace and moan and try to draw himself away. Photophobia, however, is absent; as the individual does not complain we can form no judgment as to the presence of headache. Vomiting is not observed.

"Rigidity in its various manifestations is always prominent, occupying with hyperesthesia the centre of the wet-brain picture. The degree to which it is present is significant of the severity of the particular case; thus Dana remarks that when the neck becomes stiff the outlook is hopeless. Kernig's sign is always present to some extent; toward the end it becomes marked.

"The deep reflexes are early increased, as is the rule in delirium tremens; later, with the increase in the edema, they are lost. The pupils are usually small, equal, regular, responding sluggishly to light; they dilate somewhat if the patient can be aroused, narrowing down once more as he relapses into coma. In a small percentage of cases we have observed one or all of the criteria of the Argyll-Robertson phenomenon—usually the reflex rigidity—a condition which other observers, notably Nonne and Uhthoff, have described in long-standing alcoholism. It is a mooted question whether this pupillary condition is permanent or not."

The authors are not yet prepared to express themselves definitely as to the condition of the cerebrospinal fluid beyond the fact that there is no abnormality as to cells and globulin content. As to pressure conditions they have not made manometric observations but have judged the pressure only by the velocity of the flow. The fluid does not spurt out but comes drop by drop with a rapidity not much different from normal. However, they quote Dana as having found a high tension the rule. The condition is often marked by the presence of some terminal infection, especially bronchopneumonia.

The authors were fortunate in securing the services of Dr. E. R. Le Count to make post mortem examinations. The following statement by him is included in the article:

"As a rule, edema of the brain in delirium tremens is characterized by two features, which, although they do not serve to distinguish it invariably as to etiology, are nevertheless frequently helpful in determining the cause of death; for without knowledge of the clinical condition, it may be difficult to conclude from any post mortem examination that death was due to delirium tremens.

"The pia-arachnoid membranes are lifted away from the brain over the vertex, both in front and behind, but principally anterior to a line passing over the head between the external auditory meati. The fluid, as it is seen under these transparent membranes, appears slightly yellowish. In a glass pipette it is quite clear and colorless; naturally the fluid is most abundant opposite the sulci, but in many instances it is so plentiful that the arachnoid, or the outermost portion of the pia-arachnoid is lifted away from the surface or highest part of the convolutions.

"The fluid is, strictly speaking, in the loose meshwork which connects the arachnoid with the pia, for when the outer layer is broken or torn away and the fluid released there still remains the vessel-bearing part of the pia covering the brain.

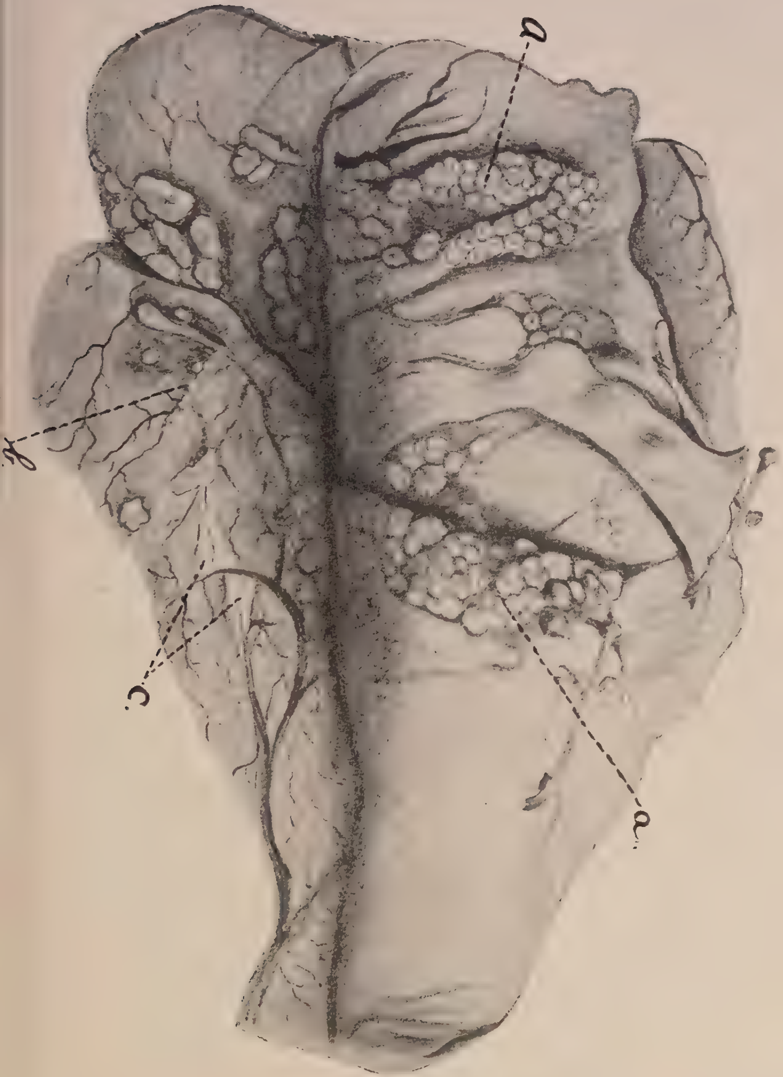
"The other feature is more noticeable after the brain is removed. It is a widening of the sulci and a narrowing of the convolutions, principally of the frontal and parietal lobes. This may be general for these regions, but often there are places where pits with dimensions of 2 to 3 cm. and 0.5 cm. in depth occur—pits into which about one-half of the terminal phalanx of the little finger may be laid. These pits, or more marked and localized regions of atrophy, are at the meeting-points of the sulci.

"There is a more or less prevalent idea in medical literature and circles that a fibrous leptomeningitis in patches may result from the long-continued use of alcoholic beverages. I have not found it with any regularity in the brains of persons dying of delirium tremens, and it certainly is not as characteristic as the two features emphasized.

"Another change is a softening or increased moisture of the brain tissue; but this, too, is inconstant and in some measure probably connected with cadaveric decomposition. In some instances the finer arterioles of the pia are more engorged with blood than in others; this apparently is associated with a type of active or maniacal delirium rather than with those showing a lethargic or semicomatose delirium. The atrophy of the cerebral cortex and the accumulation of fluid have impressed me as an oedema *ex vacuo;* and, certainly, there is no indication at the post mortem examination that the fluid during life is under an increased pressure."

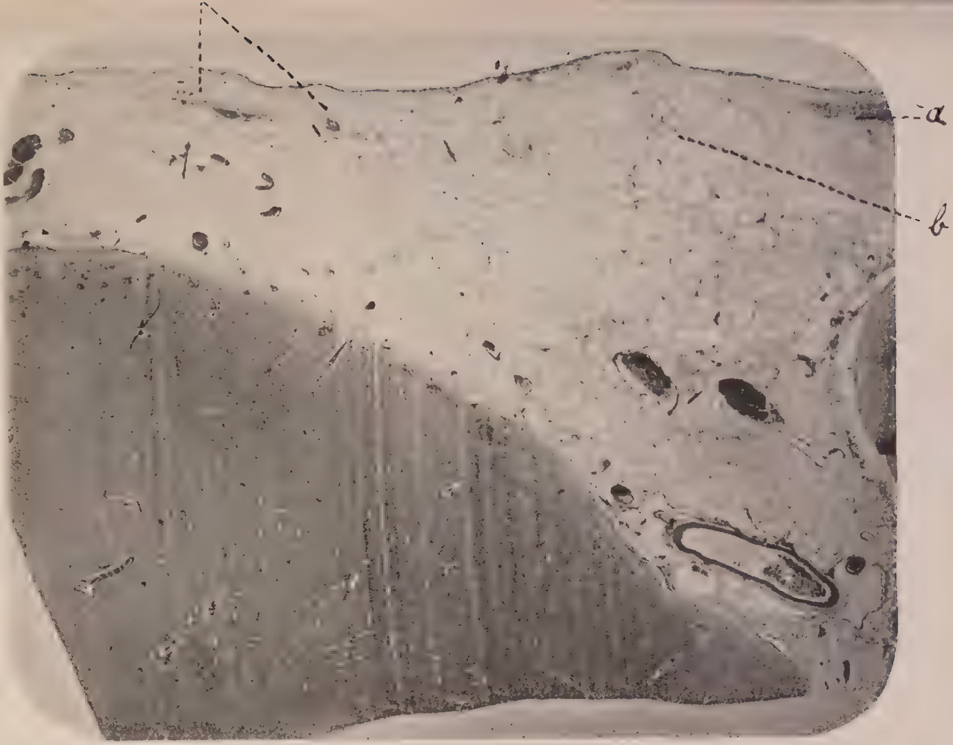
After discussing the diagnosis, which may be very dif-

PLATE I.



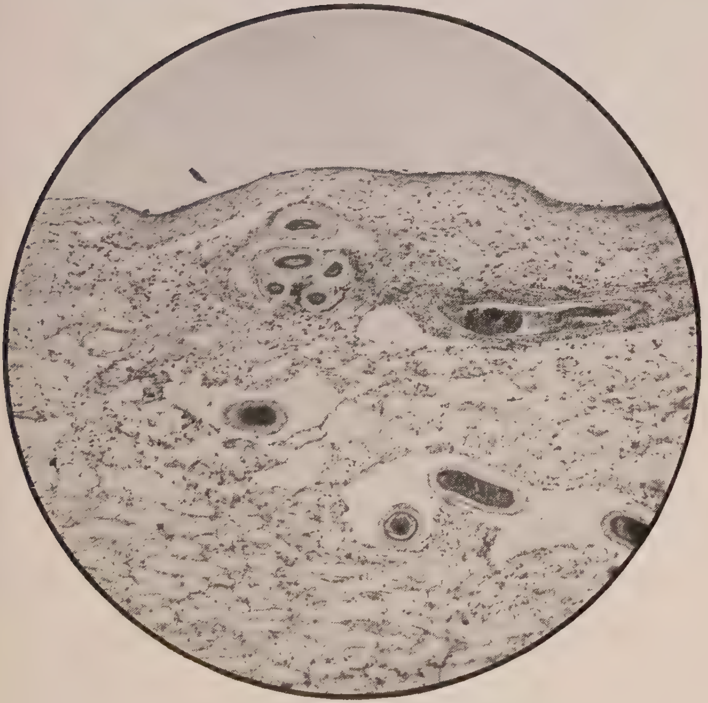
Drawing of the region of the Sylvian fissure. (a) Cluster of nodular gummas; (b) Chain of minute gummas—gummatous lymphangitis; (c) Plaques of coalescent gummas—"fibrohyperplastic syphilitic meningitis" (Nonne), "Sclerogummatous meningitis" (Sézary), etc.—Le Count and Dewey (see page 59).

PLATE II.



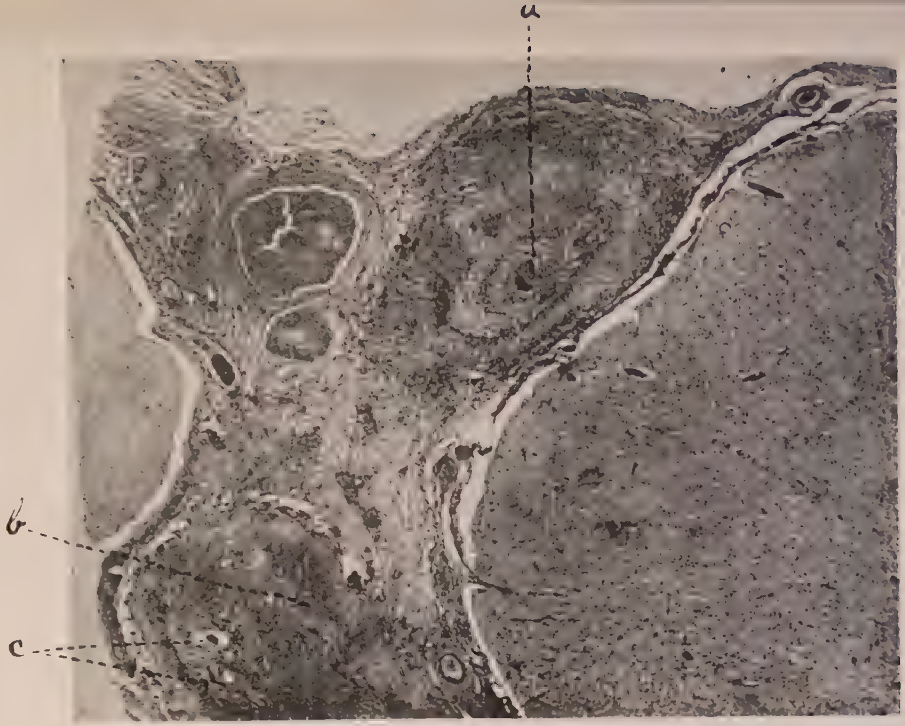
Thickened arachnoid with focal lesions over a sulcus in the right insula. At (a) a fresh or recent cellular exudate; at (b) an arachnoid scar, somewhat necrotic in the center; at (c) changes about small arterioles and the scattered cellular exudate.

PLATE III.



Cellular exudate and changes in the outer walls of small arterioles shown at (c) in Plate II.—Le Count and Dewey (see page 59).

PLATE IV.



Gummatous nodular syphilis of the meninges—a rare form of syphilis characterized by a hyperplastic inflammation. Gummas in the occipitoparietal fissure. The gummas occupy the place of blood-vessels. (a) Remains of an artery; (b) portion of the proliferated elastica interna, (c) newly formed vessels in the gumma occupy-

ficult, the authors express themselves as follows regarding course, prognosis, and treatment:

"The duration of wet brain is variable, the condition lasting from two to twelve weeks, usually about three. The mortality is nearly 75 per cent.; death may occur at any time, oftenest from a bronchopneumonia, which frequently can scarcely be diagnosed in view of the paucity of physical signs. Unfavorable symptoms, indicative of an increase in the edema, are: augmented muscular rigidity, especially of the neck muscles, diminution in the size of the pupils and more marked sluggishness in their response to light, and deepening of the coma. The pulse finally becomes rapid and feeble, there is incontinence of urine and feces, and death occurs.

"As to treatment, aside from symptomatic measures, little can be done. The death rate would indicate this. Cardiac stimulants are in order. The nutrition of the patient suffers markedly consequent upon the long state of coma; persistent effort should be made to force liquids; and in the severer cases it may be necessary to give alimentation by the nasal tube. Elimination must also not be neglected. Ergot we have found harmful as compared with its usefulness in the asthenic type of delirium tremens. Lumbar puncture has been of no service in our hands, contrary to favorable reports by Dana. Scientific hydrotherapy, now not available to us, may prove an important addition to our therapeutics."

The Cerebrospinal Fluid and the Effect of Lumbar Puncture in Delirium Tremens. Richard Steinebach[5] relates how in October, 1912, a patient with severe delirium tremens and Argyll-Robertson pupil was brought to the hospital at Dortmund. Lumbar puncture was made at once. The fluid was under increased pressure but was entirely normal on examination. Immediately after the puncture the patient became quiet, fell asleep without any hypnotic and was well on awakening. The delirium did not return but the pupillary condition remained. Three months later he had a similar experience, and meanwhile Schottmüller and Schumm had

---

(5) Deutsche med. Wochenschr., Mar. 25, 1915.

shown that in alcoholic intoxication alcohol appears in the spinal fluid, the pressure of which becomes increased. Since then Steinebach has observed 52 cases of delirium tremens, in 18 of which lumbar puncture was made. The pressure was normal in only four cases. In the other 14 cases, or 78 per cent., the pressure was usually decidedly increased. A pressure up to a height of 150 mm. was considered normal. In many of the cases tabulated the pressure was 270 to 370 mm. Fifteen to 30 c.c. were usually removed. The iodoform test for alcohol was used and traces were found in nearly all cases. The amount of alcohol in the spinal fluid was found to depend altogether on the time elapsed since the last ingestion of alcohol and the quantity then consumed. It bore no relation to the state of the delirium itself. In order to determine whether the increased pressure might not be a feature of chronic alcoholism rather than of delirium tremens punctures were made in numerous chronic alcoholics but in the absence of delirium increased pressure was never found. The author is very enthusiastic about the therapeutic effect of the puncture. In nearly all cases the course was shorter and milder than in cases without puncture. In fact in most cases the experience with the first case related above was repeated. A few times the delirium persisted and improvement set in after a second puncture. In only one case was the treatment by repeated punctures a complete failure. Compared with the average duration without puncture the duration of the delirium was shortened by 60 per cent. The procedure was of particular value in saving life in cases complicated by pneumonia or fractures.

The authors believe that the increased pressure of the cerebrospinal fluid in acute alcoholic intoxication is due to increased secretion produced by irritation of the meninges by alcohol. This is also strongly suggested by the experimental work of Braun and Finkelnburg.

As stated, the presence of alcohol in the fluid has no relationship to the delirium. This agrees with the clinical fact that delirium tremens often breaks out during a period of abstinence. Consequently the increased pressure in delirium tremens can not be directly produced by alcohol and is of different origin from that of acute intoxication. It has already been suggested by Bonhoeffer and Bumke that the delirium is produced by a so-called intermediate poison, probably originating in the intestinal tract and which normally is excreted through the lungs. This substance may then cause the meningeal irritation and increased secretion of cerebrospinal fluid. This is all the more likely to occur as chronic inflammatory changes already frequently exist in chronic alcoholism. The good effect of the puncture might be attributed merely to the relief of pressure, as is the case in acute serous meningitis. However, equally prompt relief has been observed when the pressure was normal. For this reason it is not improbable that the relief is produced by the removal of "intermediate poisons" from the fluids. It is therefore desirable to remove as much fluid as possible and introduce sufficient physiologic salt solution to restore normal pressure.

THE SYPHILITIC DISEASES OF THE NERVOUS SYSTEM.

Syphilis of the Meninges. A preliminary account of the extensive work by E. R. Le Count and Kaethe Dewey on syphilitic meningitis, with complete study of more than 50 brains, was given in the Practical Medicine Series, 1914, Vol. 10, p. 18. A more extensive work by these authors,[6] profusely illustrated, has now appeared. The meningeal changes were studied in great detail and the authors make out a very strong case for the syphilitic nature of the so-called "arachnoid" scars described, and referred to in the previous report. In the numerous and excellent illustrations, the gradual transitions between meningeal gumma and scar are shown. Of unusual clinical interest is the occurrence of sudden death in 10 of the 55 cases studied. The changes in the meninges were inadequate to explain death. The tissue of the brains showed no noteworthy

---

(6) Jour. Inf. Dis., 1915, Vol. 16, p. 142.

gross changes and the microscopic changes were slight. As sudden death in paretic dementia is quite common, the question is raised whether these cases really belonged to that category, but this suspicion was not borne out by histologic examination. For details of the meningeal changes see plates I-IV.

An Extensive Clinical Study of Syphilis of the Nervous System, based on the rich material of the London Hospital has been made by Henry Head and E. G. Fernsides,[7] whose report covers 140 pages. The article contains a wealth of observations and diagnostic and therapeutic conclusions. We can only touch upon the principal features. First of all we learn that all manifestations of syphilis of the central nervous system are consequent on the direct activity of the spirochaete pallida. All the cases are divided into two large groups:

1. *Syphilis meningo-vascularis.* This group includes most of the conditions usually spoken of as "subacute," "chronic," "tertiary" and "gummatous," which are mainly dependent on disease of the meninges and vessels. Seven symptom groups are discussed: Cerebral forms; hemiplegia; affections of the cranial nerves; muscular atrophy; myelitis; lateral and combined degenerations; epilepsy. In this group the character of the Wassermann reaction in the spinal fluid depends upon whether the spinal or basal meninges are affected. Should clinical evidence point to affection of the contents of the spinal canal, and occasionally when the basal meninges alone appear to be affected, the reaction is positive in the spinal fluid. When, however, the disease seems to be limited to the intracranial contents the reaction in the fluid tends to be negative or weakly positive. Under treatment with salvarsan or neosalvarsan, the Wassermann reaction, if at first positive, will usually become negative in the fluid within 6 months. From the cases tabulated it is seen that from one to four intravenous doses of neosalvarsan were given, with potassium iodide in the intervals.

---

(7) Brain, 1914, Vol. 37, p. 1.

2. *Syphilis centralis.* This group, which includes the conditions formerly designated "parasyphilitic," is considered under the following headings: Paretic dementia; tabes; muscular atrophy; optic atrophy; gastric crises; epileptic manifestations. In all of them the lesion lies mainly within the essential structures of the central nervous system and both neuroglia and the nerve elements participate in the tissue reaction. This results in the death and degeneration of certain systems of cells and fibres, and to these secondary consequences may be due the greater part of the clinical manifestations. In these cases the Wassermann reaction in the spinal fluid is strongly positive so long as the disease is active. When, however, it has come to an end, leaving behind it a greater or less amount of irreparable degeneration, the Wassermann reaction may diminish in strength or even become negative. In this group the effect of treatment is much less favorable than in the first group. The tables show that from two to four intravenous doses of neosalvarsan were given to each of 14 patients, and one paretic had four intraspinal injections of 10 c.c. of salvarsanized serum.

Early Involvement of the Nervous System in Syphilis as Demonstrated by Examination of the Spinal Fluid. U. J. Wile and J. H. Stokes[8] of the department of dermatology and syphilology of the University of Michigan have made routine examination of the spinal fluid of all their syphilitic patients and also subjected them to routine neurologic, ophthalmologic and otologic examinations. Their first report contains the histories of 6 cases examined during the primary stage; that is, before the appearance of any lesions of the skin or mucous membranes. Lumbar puncture was made in five of these cases and the fluid was abnormal in four. Two showed increased cell count, one as high as 200 cells, and the globulin test was positive in three. The Wassermann reaction was positive with the blood in all of the five cases but with the fluid it was only doubtfully positive in two. The early involvement of the

---

(8) Jour. Am. Med. Ass'n., March 20 and May 1, 1915, Vol. 64, pp. 979 and 1465.

optic nerve was most remarkable, five of the six cases showing a neuroretinitis and the auditory nerve was affected in three cases. The tendon reflexes in the legs were increased in three cases and one showed sensory disturbance in the toes. These observations corroborate those of Wechselmann, who also reports positive findings in the spinal fluid in 6 cases of primary syphilis. Leopold[9] demonstrated changes both in the spinal fluid and in the nervous system itself in 6 out of 16 cases of primary syphilis. The general conclusions are as follows:

1. The nervous system may be and probably is frequently involved before there are other evidences of the hematogenous spread of the treponema pallidum from the site of the initial sore.

2. Such involvement may be slight as far as clinical symptoms go, and may not be accompanied by changes in the spinal fluid as measured by our present methods.

3. Serious involvement, however, may occur extremely early with very marked changes in the cerebrospinal fluid and with definite impairment of nervous function.

4. The clinical changes most commonly noted in this preroseolar period are: headache, involvement of the second and eighth nerves, and increased reflexes. Of these the headache is most commonly associated with demonstrable changes in the spinal fluid.

5. Absence of any of the three accepted criteria of nervous system involvement in the spinal fluid can be accepted as negating the presence of syphilis of the brain, meninges or cord only when a careful examination fails to reveal any symptoms pointing to involvement.

Their second report brings the number of observed cases of early cerebrospinal syphilis up to 62. The authors do not corroborate the claim made by others that involvement of the brain and cord in secondary syphilis could be ruled out if the Wassermann reaction

---

(9) Arch. f. Dermat. u. Syphilis, 1914, Vol. 120, p. 101.

in the fluid is negative. Nor do they accept the theory of Zaloziecki that the positive reaction in the fluid might be due to a filtration of complement binding substances from the blood.

"The great frequency with which we have found definite changes in the cerebrospinal fluid without any manifest neurologic objective findings makes it seem highly probable that for the most part the involvement of the nervous system in early syphilis is of an ephemeral character. Under appropriate and vigorous treatment the fluid soon resumes its normal appearance. The great frequency with which the second and eighth nerve as well as other neurologic disturbances can occur without any demonstrable change in the fluid shows clearly that such negative findings in the spinal fluid are of value only when careful neurologic examination has shown that there is no involvement of the cranial nerves. We believe that the fate of every syphilitic, with regard to the integrity of his nervous system, is determined in the first months of his infection, since it is then that the nervous system receives its quota of the spirochaetes."

The Pathology of Tabetic Ocular Palsy, with Remarks on the Relation of Syphilis to the So-Called Parasyphilitic Diseases. William G. Spiller[1] states that difference of opinion still exists as to the nuclear or nerve origin of tabetic ocular palsies, and a distinction is made by some in the pathology of the ocular palsies of tabes and brain syphilis. From his own studies he is inclined to believe that this distinction is unreliable and that in this respect also the sharp limitation formerly made of parasyphilis and cerebrospinal syphilis needs much modification. He relates the following case as one in point:

The patient was a man who had a chancre in 1895 and in 1908 developed a painless swelling of the right knee. In 1911 bilateral ptosis set in, so that he had to use his fingers to raise the upper eyelids. He had suffered from shooting pains in the legs for some time

---

(1) Jour. Nerv. and Ment. Dis., 1915, Vol. 42, p. 15.

before the arthropathy (Charcot joint) of the knee developed and also had sensations of pins and needles in the legs as well as a girdle sensation about the lower ribs. In walking he stubbed his toes and evidently had impairment of the sense of position. His urine dribbled occasionally and at times urination was accompanied by much straining. The knee and ankle jerks were absent, the pupils did not react, there were total internal and external ophthalmoplegia of both eyes and some degree of optic atrophy. Hence, clinically, the case was one of tabes with a Charcot joint and very pronounced ocular involvement. The histologic study of the ocular nerves and tracts was made with great care and is very instructive. Each oculomotor nerve (third nerve) showed much lymphocytic infiltration, more intense in the left. These nerves were much and equally degenerated and the degeneration was greater than that of the abducens and trochlear nerves. The oculomotor nuclei were greatly atrophied and contained few nerve cells, and the oculomotor fibres within the cerebral peduncles were much fewer than normal. The left abducens nucleus was considerably more atrophied than the right, although the right nucleus was much affected. The abducens nerves themselves were also much atrophied, the left more than the right. Both of these nerves presented considerable lymphocytic infiltration, the left more than the right. The degeneration of the oculomotor nerves was so far advanced that it was impossible to decide whether the degeneration began in the nerve or in the nucleus, but the findings in the abducens nerves were of importance in this respect. The left nucleus and nerve were considerably more degenerated than the right, and the lymphocytic infiltration of the left nerve at its exit from the upper part of the bulb was greater than in the right nerve. According to Spiller these findings would seem to indicate that the syphilitic process was primarily in the nerve rather than in the nucleus and would make a distinction between the ocular palsies of tabes and of syphilis unreliable. This case clinically was one of tabes and the pathologic findings in the cord were those of tabes.

Among other writers on this subject, Uhthoff, the well known authority on the neurology of the eye, has advocated the view that tabetic ocular palsies are usually of nuclear origin, and similar views are held by Wilbrand and Saenger (authors of a work in several volumes, on the neurology of the eye). However, Spiller, who has studied sections from eleven cases of tabes, has been impressed by the frequent lymphocytic infiltration of the pia and the greater intensity of this infiltration about the cerebral peduncles where the ocular nerves are close together.

The Auditory Nerve Affections in Syphilis are discussed by Arthur W. M. Ellis and Homer F. Swift.[2] The reader will recall the animated discussion of a few years ago as to whether salvarsan was directly injurious to this nerve. It was claimed that auditory nerve involvement had become more frequent and often appeared soon after injection of salvarsan. The problem appears to be solved, as it is satisfactorily demonstrated that this nerve is very frequently involved in cases not treated with salvarsan. It also appears settled that lesions of the nerve itself from extension of inflammation from the meninges are much more common than actual syphilitic disease of the labyrinth. Ellis and Swift report seven cases in which examination of the spinal fluid and involvement of other cranial nerves gave evidence of the meningeal infection. This involvement is by far most frequent in inadequately treated cases and is an indication of a more or less general infection of the central nervous system calling for examination of the spinal fluid and for thorough treatment.

Intraspinal Treatment. An excellent and authoritative review of this subject is contributed by Homer F. Swift,[3] who with Ellis devised the so-called Swift-Ellis

---

(2) Jour. Am. Med. Ass'n., May 1, 1915, Vol. 64, p. 1471.
(3) Jour. Am. Med. Ass'n., July 17, 1915, Vol. 65, p. 209.

treatment. He outlines the methods in vogue in the following way:

I. Substances injected:
  (*a*) Neosalvarsan dissolved in water, normal saline or cerebrospinal fluid.
  (*b*) Serum—salvarsanized in vivo:
    1. Human serum.
    2. Serum of animals.
  (*c*) Serum salvarsanized in vitro:
    1. With salvarsan.
    2. With neosalvarsan.
  (*d*) Mercury:
    1. Mercuric chlorid lavage of subarachnoid space.
    2. Mercuric cyanid dissolved in saline.
    3. Mercurialized serum.

II. Mode of application:
  (*a*) Into spinal subarachnoid space by lumbar puncture.
  (*b*) Into cranial subarachnoid space through trephine opening:
    1. Subdurally.
    2. Into third ventricle.
  (*c*) Into large basal subarachnoid cistern through sphenoidal fissure.

After reviewing the report of the results with the methods of injecting neosalvarsan intraspinally, especially by Ravaut's method, Swift concludes that because of the uncertainty of the sequelae, intraspinal injections of neosalvarsan should be given with extreme caution, if at all, and the dose should never exceed 0.5 mg.

Ogilvie's method of salvarsanizing serum in vitro by adding a small amount of alkalinized salvarsan to human serum is pronounced "an advance in the preparation of serum for intraspinal injection." Lately Swift has studied the spirochaeticidal effect of such serum and found it superior to that obtained from patients after intravenous injection of salvarsan. Experience seems to have proved that it is safer to inject solutions of salvarsan or of neosalvarsan in serum than in salt solution. The author also finds the injection of mercurialized serum, devised by Byrnes, promising, and adds that perhaps alternate injections of mercurialized and salvarsanized serum combined with vigorous general therapy will give better results than any of the methods so far applied.

The intracranial injections are dismissed by Swift as having little if any advantage over intraspinal injections so far as the distribution of solutions is concerned. Therefore the difference in the ease of operation makes the intraspinal route the one of choice.

The objections to intraspinal therapy are thus enumerated:

"1. Intravenous methods alone yield equally good results.

"2. The difficulty in the technic, the pain from intraspinal injections and the unfortunate results which follow intraspinal injections of neosalvarsan make all intraspinal treatment undesirable.

"3. The cerebrospinal fluid sometimes contains arsenic after intravenous injections of salvarsan.

"4. The blood serum withdrawn one hour after intravenous injections of salvarsan does not contain sufficient arsenic to render it of any value for intraspinal injection."

In view of Swift's thorough familiarity with the subject his reply to these objections is very instructive.

"1. While it is evident that intravenous injections of salvarsan are of great benefit in the treatment of syphilis of the central nervous system, and in many instances are sufficient to effect a functional cure or arrest of degeneration and change the cerebrospinal fluid to normal, still in other cases the conditions are apparently stationary under vigorous general treatment but yield when intraspinal therapy is instituted. The literature contains many such examples. Fordyce gives in detail several such cases. Eskuchen says, 'It is remarkable that cases showed rapid and noticeable improvement after combined intraspinal and intravenous therapy where other treatment had been fruitless.' Ayer made similar observations. Furthermore, the numerous modifications of subarachnoid methods are striking proof of the apparent desirability of local therapy.

"2. Although the technic of intraspinal injections is more difficult than that of intravenous injection, this difficulty is not insurmountable and in many instances the additional effort is justified. The pains following injections of human serum are transitory, and only occasionally are they severe enough to make this form of treatment impossible. A few cases of severe aseptic meningitis have been reported following intraspinal injections of human serum, but these accidents are not frequent enough to cause the method to be discarded. The unfavorable sequelae which follow intraspinal injections of 1 mg. or more of neosalvarsan are sufficient to make injections of this substance questionable, but should not interdict all forms of intraspinal therapy.

"3. Numerous workers have shown the relative or absolute impermeability of the choroid plexus for most inorganic substances, and all are agreed that but few drugs which can be demonstrated in the blood after administration by mouth, subcutaneously or intravenously, can be demonstrated in the cerebrospinal fluid. Hall has reviewed the literature on the subject of arsenic excretion, and shown how relatively infrequently has this substance been demonstrated in the fluid after intravenous injection of salvarsan. In his own cases it was not demonstrable following neosalvarsan in five cases, and in only two out of six cases after salvarsan. He calls attention to the importance of having the lumbar puncture needle specially cleaned. With the special technic for arsenic estimation noted below, we have tested pooled fluids up to 100 c.c., which were withdrawn the day following intravenous injections of salvarsan, and obtained almost uniformly negative results, and when arsenic was present the quantities were too small to estimate. In view of all these negative results, the constant positive findings of Sachs, Strauss and Kaliski are hard to explain. It may be that they were fortunate enough to test the fluid from cases in which the permeability of the meninges or choroid plexus was markedly impaired by the syphilitic process.

"4. The low arsenic content of the serum seems to have been the chief point of attack by those who have objected to intraspinal treatment. It may be noted in passing that the question is not alone a chemical one but is also biologic in nature. Nevertheless, we have made a number of observations of the salvarsan content of the serum. Repeated tests with the Abelin diazo reaction have shown the presence of the organic radical, and the application of the Ehrlich-Berthenn paradimethylamidobenzaldehyd test has shown that arsenic is present in the form of salvarsan. The arsenic content of the serum has also been estimated by a method which Dr. Vinograd elaborated for this special purpose. This method depends for its accuracy on the oxidation of the organic matter in a sealed bomb so that during the incineration at high temperatures none of the arsenic escapes. In fifteen different patients, twenty-five intravenous injections of 0.5 gm. salvarsan each were given, the blood was withdrawn after one hour, and the serum separated and tested for arsenic content. The accompanying table shows the content per cubic centimeter in terms of salvarsan.

"Sixteen of the serums contained 0.01 mg. or more, which would yield at least 0.12 mg. if 12 c.c. were injected, or 0.2 mg. if 20 c.c., the amount now recommended, were injected; and stronger serums yield even more. Benedict found between 0.04 and 0.1 mg. of metallic arsenic in 20 c.c. of whole blood furnished him by Sachs, Strauss and Kaliski. As salvarsan is about one-third arsenic, his results in terms of salvarsan were 0.12 to 0.3 mg., figures closely approximating our own for equal quantities of serum. Fordyce and Ogilvie have shown that it is unsafe to add more than from 0.25 to 0.5 mg. to serum for repeated intraspinal injection, and that the injection of these small quantities in serum is followed by decided improvement. Analysis of many of the serums from patients shows that in from 12 to 20 c.c. this amount of salvarsan is often present, so the objection that the serum is useless because of the low salvarsan content seems invalid. Its variability in salvarsan content is a valid objection, and can be obviated by adding definite quantities of the drug in vitro."

ARSENIC CONTENT OF SERUM IN TERMS OF SALVARSAN.

Number of serums.	Salvarsan per cubic centimeter mg.
1	0.05
1	0.04
3	0.03
2	0.025
4	0.02
5	0.01
4	0.006
2	0.005
3	0.004
Total 25	Average 0.016

The action of intraspinal injections of serum, according to Swift, may be due to one of several factors:

"1. The serum is spirocheticidal.

"2. It may contain syphilitic antibodies.

"3. The local irritation may increase the permeability of the meninges.

"4. The acute irritation produced by the serum may exert a beneficial effect on the chronic inflammatory process.

"5. The normal serum may contain substances which, when brought into contact with the syphilitic exudate, cause it to resolve.

"1. We have demonstrated that the 'autosalvarsanized serum' has a definite spirocheticidal effect which is increased by heating, and Stuhmer has shown it to have similar action on trypanosomes. Although the actual salvarsan content may be small, by subarachnoid injection we bring a definite spirocheticidal substance into close contact with the etiologic agent, a contact which is much more intimate than when the drug is circulating in the blood stream.

"2. Although the syphilitic antibodies are not directly demonstrable, it is reasonable to suppose that they exist. It has been demonstrated that the serum of salvarsan-treated patients has a curative effect when injected subcutaneously into infants with congenital syphilis, or into the subjects of acquired syphilis. This curative effect is supposed to be due to an increase in antibodies excited by the salvarsan.

"3. Sicard has suggested that the local irritation produced by foreign substances which are injected into the subarachnoid space increases the permeability of the tissues locally, and thus salvarsan injected intravenously is brought into more intimate contact with the diseased tissues; in other words, that the normal barrier between the subarachnoid space and blood stream is partially broken down. Stillman and I have investigated this point experimentally, and have shown that after intravenous injections of salvarsan no more arsenic is demonstrable in the cord or brain of cats that received intraspinal injections of normal saline, normal serum, salvarsanized serum or mercuric cyanid, than in the cord and brains of animals that received no subarachnoid injections. We have also treated patients intraspinally with normal serum, one hour later have given an intravenous injection of salvarsan, and the following day have withdrawn the cerebrospinal fluid and tested it for arsenic, but found that it contained no more arsenic than did the fluid of controls who had not received a previous intraspinal injection. Thus both directly and indirectly it has been proved that the local irritation of the meninges does not apparently increase their permeability for salvarsan which is circulating in the blood.

"4. The beneficial effect of acute congestion on chronic inflammatory processes is the well-known theory on which Bier's hyperemic treatment is founded. After intraspinal injections of serum, there is a transitory aseptic irritation which may be of benefit as a local therapeutic measure.

"5. The interesting improvement following injections of normal serum in the treatment of psoriasis, dermatitis herpetiformis and other skin diseases suggests that the normal balance of the various substances in the serum may be disturbed by the coagulation of the blood outside the body, thus resulting in the elaboration of some substance having therapeutic value. The subarachnoid injection of this substance might be of benefit. I realize that the last two possibilities are hypothetic; still they are the only explanations for the interesting fact that a number of patients have shown more or less tendency of the cerebrospinal fluid to approximate the normal, and clinical improvement results under the intraspinal injection of their own or normal serum. Nine cases were studied. Two of them showed practically no change in the fluid following repeated lumbar punctures and the withdrawal of large amounts of fluid. In one, the fluid became normal after six injections of normal serum; in another the Wassermann reaction became negative after six injections of the patient's own serum. Two showed only slight changes under six and seven injections, respectively, of normal serum, but distinct change under injections of salvarsanized serum. Two showed well-marked improvement under eleven and seventeen injections of their own serum, and a third patient only slight change after twelve injections of his own serum. In all of the patients who received injections of their own or normal serum, there was some improvement in one or more of the abnormal elements, in four of them marked diminution in both pleocytosis and Wassermann reaction. Two who were slow in responding to normal serum showed more marked improvement from salvarsanized serum. When we recall that during the period of observation none of the patients received any other antisyphilitic treatment, it is evident that injections of nonsalvarsanized serum were beneficial." The use of serum as a vehicle for spirochetecidal substances seems therefore to be established on a rational basis.

The conclusions of Swift are as follows:

"We feel that intraspinal injections of 'autosalvarsanized serum' or serum to which a small amount of salvarsan or mercury is added, is of distinct help in certain cases of tabes and cerebrospinal syphilis. Not all patients with these diseases require intraspinal treatment. Many of them respond well to intravenous injections of salvarsan combined with mercury and iodids properly administered. In other cases, the symptoms and abnormal cerebrospinal fluids are not controlled by general therapy, and it is in this class that we believe the addition of intraspinal therapy to be of value. Both the clinical side and laboratory evidence of active disease should be considered, and any treatment controlled by repeated examinations of the blood and cerebrospinal fluid. Although the treatment of these diseases should be systematic, it should not be so rigid that individual indications should be disregarded. Not infrequently one sees improvement only after active treatment has been discontinued. Others seem to require constant treatment until all evidences of active disease have disappeared. Only by considering all these factors can consistent beneficial results be obtained."

Intraspinal Injection of Serum Salvarsanized in Vitro. Hanson S. Ogilvie[4] has originated a method of preparing human serum containing a definite quantity of salvarsan. Blood is drawn and a pure serum free from cells and fibrin is secured in the usual manner by means of a high speed centrifuge. To 15 c.c. of serum is then added the amount of salvarsan to be given. This is done by mixing the salvarsan as for an intravenous treatment, using freshly distilled and boiled water, and bringing the total quantity up so that each 40 c.c. of the solution will contain 1.0 dg. (0.1 gm.) of the drug. Each cubic centimeter of this solution will then contain 2.5 mg. of salvarsan. With a 1 c.c. pipet, graduated into tenths, the desired amount can be readily measured from 0.25 mg. upward. *In adding the sodium hydroxid it is of the greatest importance to use only the exact amount required to alkalinize the*

---

(4) Jour. Am. Med. Ass'n., Nov. 28, 1914, Vol. 63, p. 1936.

solution very faintly. When this has once been determined by testing with litmus paper, the sodium hydroxid should always be added quickly, and not drop by drop. *It is also very important that the temperature of the salvarsan and serum be the same when the two are mixed.* The serum is then gently agitated to mix the two thoroughly and is placed in a thermostat at 37° C. for 45 minutes. From this it is placed in a thermostat at 56° C. for 30 minutes. It is now ready to be given intraspinally and it should be used as soon after preparation as possible. *Under no circumstances should a serum be used that is more than three hours old.*

The author has used the method in 15 cases and the results are favorable, but he admits that the report must be considered purely preliminary as sufficient time has not elapsed. He tried doses of various size and emphasizes strongly the importance of keeping the dosage within 1 mg.

Intraspinal Injection of Mercurialized Serum. The happy idea occurred to C. M. Byrnes,[5] that it might be possible to prepare a mercurialized serum suitable for intraspinal therapy. First of all Byrnes endeavored to determine the amount of mercury present in the blood serum after intensive mercurial treatment. Fifteen patients suffering from syphilitic diseases of the nervous system were divided into three groups of five each. The first group received inunctions; the second, daily intramuscular injections of the biniodide in oil; and the third, mercuric chloride and potassium iodide by mouth. All were carried to the point of saturation when blood was withdrawn and serum obtained for chemical analysis. The results were:

1. The serum of patients treated by inunctions showed a slightly higher mercurial content than that from the other two groups.

2. The average mercurial content of serum from all three groups was approximately 0.0000059 gm. per c.c.

3. The spinal fluid in two instances showed only a

---

(5) Jour. Am. Med. Ass'n., Dec. 19, 1914, Vol. 63, p. 2182.

questionable trace of mercury, which was too small to be estimated.

It further occurred to Byrnes that the previously reported irritative symptoms produced by intraspinal injection of inorganic mercurial salts might have been partly due to the coagulation produced by the affinity of such salts for the protein molecule, resulting in the formation of an albuminate of mercury. It therefore seemed advisable to use the albuminate in which the affinity for protein already has been satisfied. Furthermore, since the manufactured albuminate on the market is difficult to obtain, unstable and insoluble, it was decided that more satisfactory results might be obtained by adding a mercurial salt directly to human serum. The following technique for the preparation and administration of the serum was elaborated:

1. Sufficient blood is withdrawn to yield from 12 to 30 c.c. of serum. The larger amount is obtained if concentrated serum is to be used. After the blood has coagulated the serum is pipetted and if necessary,
2. Centrifugalized for 20 minutes.
3. If diluted serum is to be used, to 12 c.c. of the centrifugalized specimen is added 1 c.c. of a solution of mercuric chloride in freshly distilled water so made that each c.c. contains 0.0013 gm. (1/50 grain) of mercuric chloride.
4. To the serum thus prepared is added sufficient quantity of normal salt solution to make a total volume of 30 c.c. If the concentrated serum is used this step is omitted.
5. It is heated at 56° C. for half an hour and
6. Administered by gravity at body temperature.

The author has used the method in 32 cases, namely, 13 of tabes, 2 of tabo paresis, 3 of cerebrospinal meningomyelitis and 14 of general paresis. In general the cases of tabes and meningomyelitis have shown the most marked improvement, although in a few instances general paresis has been distinctly benefited. Only slight reactions following the injections were observed. The improvement in clinical symptoms was similar to that observed with the Swift-Ellis treatment.

An advantage of the method is that on account of the great stability of the mercurialized serum it may be prepared at leisure and kept in sealed flasks until it is convenient to administer it.

Demonstration of Spirochaete Pallida in Paretic Dementia. Since the pioneer work of Noguchi and Moore several observers have succeeded in demonstrating spirochaetes in brain tissue by the silver impregnation method of Levaditi. James McIntosh and Paul Fildes[6] have a higher percentage of success than any previous investigators, the reason being that they examined fresh brain fragments by the dark ground illumination method. A fragment of cortex the size of a pin head was teased out in a drop of salt solution, placed on a slide and examined. The tissue should not be thoroughly emulsified since the specimen will then be too opaque for satisfactory examination. By this method they succeeded in demonstrating the organisms in six out of seven cases examined, while the organisms were found in sections in only three of the six positive cases, although the pieces sectioned were taken from the same locality in which the organisms were demonstrable by the direct method. The spirochaetes were always confined to the grey matter; in one case only was a single specimen seen in the meninges. They were more or less superficial and no constant relation could be observed between them and nerve cells or blood-vessels. Some spirochaetes appeared to be applied to nerve cells, but this was only an occasional appearance. No relation was found between the organisms and cellular infiltrations, and they merely appeared to be scattered quite fortuitously about the superficial layers of the cortex.

Surgical Treatment of Paretic Dementia. M. P. Passek[7] of Petrograd trephined rabbits in the frontal region and scarified the surface of the brain for the purpose of destroying the pia. After applying India ink to the scarified surface the wound was closed. In some of the animals the ink was also introduced into

---

(6) Brain, 1914, Vol. 37, p. 401.
(7) Abstract in Rev. Neurol., Mar., 1915, p. 197.

the ear veins. In all of the animals after one or two days ink particles were found in the brain cells and their processes. These results led the author to use the following method in four cases of paretic dementia: Trephine openings were made over both frontal lobes and the pia scarified. Once a week colloidal mercury was applied to this surface and the patients also received intravenous injections of salvarsan. One patient was not materially changed, two showed both mental and physical improvement, one improved only physically.

Comparison of Sleeping Sickness and Paretic Dementia is made in the following words by Edwin Goodall[8] in the course of a lecture before the Royal College of Physicians of London:

"The fact that syphilis preceded general paralysis having been established, it was highly suggestive when attention was drawn to the fact that sleeping sickness—a condition having a remarkable clinical and pathological likeness to general paralysis—followed upon trypanosomiasis, a disease with points of resemblance to syphilis, as is well brought out by Browning and McKenzie. According to Schaudinn the spirochæta pallida stands near the trypanosome in the protozoal group. It is to be noted that trypanosomiasis does not lead to sleeping sickness in all cases by any means; I do not know in what proportion the sequence occurs, but the point is of interest by analogy with the parallel circumstance in regard to syphilis and dementia paralytica. Spielmeyer states that only a very small percentage of experimental animals infected with T. gambiense shows a condition comparable to sleeping sickness. The curability of trypanosome fever and of syphilis contrasts with the incurability, at present, of sleeping sickness (the dementia of trypanosomiasis) and dementia paralytica. A brief reference to the clinical and histopathological resemblances between the last-mentioned states may be permitted. These are well brought out by Vix and by Spielmeyer and Martin.

---

(8) Lancet, Dec. 5, 1914.

The former, examining patients in the sleeping sickness camps of German East Africa, found that 55 out of 70 presented marked mental symptoms, amongst which he mentions epileptiform seizures, closely resembling those of general paralysis, exalted delusions, with, later, apathy and progressive dementia; on the physical side he observed paresis, tremors (including tongue-tremors), articulatory disturbance, ataxia, contractures, wasting, exaggerated knee-jerks, and Romberg's sign. Most interesting of all, stationary states and remissions occurred in some of these cases. A distinction from general paralysis is that the pupillary reaction is usually intact. In respect to morbid anatomy, the following were among the conditions which resemble those of dementia paralytica: edema and cloudiness of the pia, pachymeningitis hæmorrhagica, adhesions of the pia to the cortex, granularity of the ventricular ependyma, vascularity, with new vessel formation, perivascular infiltration with lymphocytes and plasma cells, rod cells, morbid changes in the nerve cells and neuroglia. Dogs infected with trypanosomes by Spielmeyer showed lymphocytosis of the cerebrospinal fluid and increase of protein.

"In marked contradistinction to the infrequency with which the treponema is still found in dementia paralytica is the frequency with which the trypanosome was found by Vix in sleeping sickness (65 out of 70 cases, in the blood or cerebrospinal fluid). Another distinction is that the proclivity of the frontal lobes to suffer in the former disease is not noticeable in the latter. The trypanosomiasis recently described as frequent in Brazil, otherwise known as Chagas' disease, and due to the T. Cruzi (which is found in all regions of the brain in cases which run a chronic course and become demented), appears likewise to result sometimes in a condition resembling dementia paralytica."

[An account of Chagas' disease, with several illustrations, is found in the Practical Medicine Series, 1913, Vol. X, p. 174.]

DISEASES OF THE BRAIN.

THE CEREBRUM.

The Cerebral Complications of Whooping Cough. Adolf Strümpell[9] contributes an article entitled "Curable severe optic neuritis with cerebellar ataxia in whooping cough (Whooping Cough Encephalitis)." That cerebral complications occur in this disease has been known for a long time. Convulsions, hemiplegia, diplegia, bulbar paralysis, ocular paralyses, disturbance of speech and severe central visual disturbances have been described. Polyneuritis and cord complications have occasionally been seen. The older literature on the subject is completely reviewed in a monograph written in 1904 by R. Neurath.[1] The visual disturbances are thoroughly discussed in Vol. XI of the Gräfe-Sämisch handbook and there are some recent noteworthy reports. Thus, E. Wiegmann[2] found pronounced optic neuritis after whooping cough in a woman 40 years old with recovery with only trifling permanent change in the optic nerves and the acuity of vision. Alexander and Nacht[3] observed a case of choked disc and complete blindness in which trephining was done. Three days later vision began to return and was completely restored in a few weeks. These authors emphasize the striking contrast between the severe choked disc and the absence of all other general symptoms of increased brain pressure, which suggests that the choked disc may depend on the general venous stasis produced by the severe paroxysms of coughing.

Strümpell observed a child four and a half years old who contracted whooping cough of only moderate severity in July, 1914. On August 12 the boy complained of his eyes, but played on the street. The next day he could not stand on his feet without support and seemed to be almost blind. This condition came on suddenly but not

---

(9) Deutsche Zeitschr. f. Nervenh., 1915, Vol. 53, p. 321.

(1) Ueber die nervösen Komplikationen und Nachkrankheiten des Keuchhustens, 1904.

(2) Klin. Monatsbl. f. Augenh., 1912, vol. 13, p. 557.

(3) Ibid, 1910, p. 645.

in connection with a paroxysm of coughing. When examined on August 17, both pupils were dilated and entirely without reaction. The ocular movements were difficult to test but seemed to be greatly limited. The blindness was complete, even light perception being entirely lost. There was very marked bilateral choked disc with swelling of almost 1 millimeter. The legs were not paralyzed but somewhat ataxic. The knee jerks were absent while the ankle jerks and abdominal reflexes were present. A slight Babinski sign was present on the left side. When the boy was made to stand he would sway and was unable to walk. This difficulty was clearly not caused by the blindness, but by marked ataxia of the trunk. The spinal fluid was clear, showed no increase in cells and gave only a weak Nonne globulin test. Nine days later the boy could stand better and on August 31, he gave evidence of light perception for the first time, with the optic neuritis receding. Two weeks later he could distinguish objects and distinguish between red and white; the outlines of the disc could be made out. In another week he could distinguish faces and the neurologic findings were normal. By the end of October he had good vision. The disc swelling had entirely disappeared, but the discs had the shiny, white appearance of complete atrophy, but without narrowing of the vessels. After another month he appeared perfectly well and the pupils reacted well to light, but the atrophic appearance of the discs remained in spite of the good vision. Strümpell is inclined to locate the lesion responsible for this striking picture in the region of the corpora quadrigemina, partly on account of the limitation in ocular movements and partly on account of the associated ataxia, which may be explained by a disturbance of the neighboring red nucleus. The exact pathologic anatomy of the whooping cough encephalitis can only be surmised, as fortunately nearly all cases recover; so the available anatomic material has been very scarce. In the few cases examined there seems to have existed a hemorrhagic inflammation with minute punctate hemorrhages, so-called "flea bite" encephalitis, or purpura cerebri. There has been some discussion as to whether such localized inflammation is "toxic" or due to direct bacterial invasion. Strümpell favors the latter view on account of the circumscribed process. Naturally this suggests the analogous influenzal encephalitis, and it is not surprising that the affections are similar, as the organisms of the two diseases seem to have a close biologic relationship.

A Case of Probable Encephalitis Due to the Inhalation of the Fumes of Gasoline is reported from Philadelphia by Charles S. Potts.[4] The patient was a man 45 years old who was admitted to the hospital in an unconscious condition on Nov. 14, 1913, with a history that while at work filling the tanks of automobiles with gasoline he had fallen over unconscious. He remained so for several hours and then passed into a stuporous condition which continued until November 25. When aroused he complained of intense headache. When examined on November 25, he presented nearly complete paralysis of the right oculomotor nerve. All movements of the left eyeball were lost except inward rotation and slight rotation outward. The left arm and leg and the lower part of the left side of the face were paretic. The left knee jerk was increased and ankle clonus and the Babinski sign were present on the left side. The movements of the left arm and leg were markedly asynergic and the gait was ataxic, of cerebellar type, with tendency to go to the left. Wassermann test was negative. It was learned that he had been working at filling gasoline tanks for 4 months and that 2 months before admission he had been seized one evening with intense headache, nausea and vomiting which lasted all night. He went to work in the morning, but ever since he had more or less headache and dizziness. During this period he began to see double, one image being to one side and above the other. Improvement gradually took place and by February the only symptoms remaining were impairment of the functions of the left oculomotor nerve, ataxia of the left arm and possibly slight weakness of the left leg. These symptoms persisted and when last seen in April no

---

(4) Jour. Nerv. and Ment. Dis., 1915, Vol. 42, p. 24.

further improvement had occurred in the patient. The author comments as follows:

"There would seem to be no doubt that the symptoms were due to a toxemia of some sort, and that it was gasoline would seem to be a justifiable conclusion in view of the premonitory symptoms and the absence of exposure to any other form of poison. The question might be raised whether there was either merely a functional disturbance or an actual organic lesion as indicated by the diagnosis of encephalitis. The writer believes the latter to be justified because, while most of the symptoms have disappeared, there still, after a lapse of a number of months, remains evidence of permanent damage to some function. The writer believes that a lesion in the region of the aqueduct of Sylvius would explain the symptoms."

In the discussion which followed the exhibition of the patient at the Philadelphia Neurological Society the tendency of acute intoxications to cause cerebellar symptoms was commented upon.

Inability to Move the Toes Except in Walking, in Cases of Superficial Cortical Lesions. Pierre Marie and Mme. Athanassio-Bénisty[5] report the case of a soldier who sustained a gunshot wound of the head, in the median line, the bullet entering 14 cm. above the root of the nose and passing out 3 cm. farther back. He did not lose consciousness and although he could stand up right away he could not walk. After a few days of vomiting and headache he could walk again. Both legs were weak, with increased reflexes and ankle clonus. A remarkable feature existed, namely, that the patient was utterly unable to make any movement with the toes when told to do so but while walking all toe movements were normal.

A similar case is reported by Pierre Marie and Thinh.[6] This soldier has a light paralysis of the left side following a superficial bullet wound of the right parietal lobe with the same condition of the toes as presented by the first patient. The authors consider the ability to use the toes automatically in walking as a striking instance

---

(5) Rev. Neurol., May-June, 1915, p. 393.
(6) Ibid., p. 407.

of spinal automatism, while the inability to execute any movement of the toes at will is due to the cortical lesion.

The Relative Frequency of the Various Forms of Coma. On the basis of the enormous material of the Cook County Hospital, Chicago, Wayne W. Bissell and E. R. LeCount[7] report some very interesting statistical data. In 200 cases examined post mortem the causes of death were as follows:

Skull fracture		85
Cerebral hemorrhage		53
Miscellaneous:		
Uremia	12	
Lobar pneumonia	10	
Meningitis	8	
Diabetic coma	6	
Atrophic cirrhosis	5	
Delirium tremens	4	
Acute endocarditis	2	
Cerebral embolism	2	
Cerebral thrombosis	2	
Suppurative mastoiditis	2	
Acute miliary tuberculosis	2	
Puerperal sepsis	1	
Lung abscess	1	
Acute syphilitic aortitis; coronary occlusion	1	
Carcinoma of the prostate	1	
Tuberculous peritonitis	1	
Senility; bronchopneumonia	1	
Addison's disease	1	62
Total		200

Only cases were included in which the patient was admitted to the hospital in coma. Cases of ordinary poisoning were also excluded. Forty-seven of the patients died within 4 hours of admission and 20 of these or 42.5 per cent. were correctly diagnosed. One hundred and sixteen died within 24 hours and 59 or 50.7 per cent. with correct diagnoses. Thirty-five died on the second

---

(7) Jour. Am. Med. Ass'n., Mar. 27, 1915, Vol. 64, p. 1041.

day, 13 or 37 per cent. with correct diagnoses. Of 14 dying on the third day 6 or 42.8 per cent. were correctly diagnosed. On the fourth day 4 (44.4 per cent.) of 9, and of the remaining 26 deaths occurring from the fifth to the seventeenth day inclusive, the diseased conditions of 18, or 70 per cent., were correctly diagnosed.

The following table relates to the 85 cases of skull fracture:

Correct diagnoses		61 (72 per cent.)
Incorrect:		
Cerebral hemorrhage	9	
Uremia	4	
No diagnosis	3	
Meningitis	2	
Cerebral contusion	2	
Fracture of clavicle; shock	1	
Cerebral thrombosis	1	
Myocarditis	1	
Dementia	1	24 (28 per cent.)
Total		85

Another table relates to the 53 cases of cerebral hemorrhage:

Correct diagnoses		27 (51 per cent.)
Incorrect:		
Uremia	16	
No diagnoses	3	
Skull fracture	2	
Meningitis	2	
Cerebral syphilis	2	
Morphine poisoning	1	26 (49 per cent.)
Total		53

The most serious diagnostic shortcomings were noted in connection with uremia. A clinical diagnosis of this condition was made in 46 cases, only 8 of which died of uremia. Altogether there were only 12 deaths from uremia. The following table is therefore of particular interest:

FORTY-SIX CLINICAL DIAGNOSES OF UREMIA.

Anatomic diagnoses:	
Cerebral hemorrhage	16
Uremia	8
Skull fracture	4
Atrophic cirrhosis	4
Meningitis	3
Lobar pneumonia	2
Mastoiditis	2
Acute miliary tuberculosis	2
Delirium tremens	1
Carcinoma of the prostate	1
Puerperal sepsis	1
Cerebral thrombosis	1
Addison's disease	1
Total	46

This state of affairs leads the authors to make the following comment:

"Regarding the diagnosis of uremia, it will be noted from the protocols that it was correct in a number of instances when death occurred in fifty minutes, seventy minutes, one hour or other similarly brief periods after entering the hospital, times altogether too short to make comprehensive examinations. These must be reckoned with as in the nature of "chance shots." It may be argued that diagnoses made under such conditions deserve no serious consideration; but, on the other hand, it has seemed to us that the tendency to deal with the diagnosis of uremia in this haphazard manner denotes a serious defect in the teaching of medicine, an ignorance of the comparative infrequency of uremic coma; finally, it should be stated that accurate figures for the relative frequency of coma of various sorts would constitute an equipment for the differential diagnosis of coma comparable in its value with the mortality statistics so useful to surgeons in making statements regarding the prognosis for operations they undertake or advise."

The Pathology of the Gliomatous Tumors of the Brain is the subject of an address before the Brooklyn Pathological Society by the distinguished Boston pathologist, W. T. Councilman.[8] The following features of gliomata as a tumor class are emphasized. The most striking common characteristic is their manner of growth, which is by infiltration and not expansion; the glioma replaces tissue and does not push it aside, so the form of the tissue replaced may be perfectly preserved. The growth of the tumor is accompanied, or preceded, by a growth of the normal glia which is very diffuse, often is seen far beyond the limit of the tumor and which makes it impossible histologically sharply to delineate the tumor.

"Another characteristic of the glioma is the tendency to cyst formation. The cysts so formed differ from the cysts in other tumors which either result from the activity of epithelial secretion or represent the remains of areas of degeneration. In the glioma the cysts are not the result of cell secretion nor do they represent areas formerly the site of degeneration. They are due to the fluid absorption of the tissue and represent an accentuation of a condition common to the entire tumor. It is possible, however, that in certain of the gliomata there may be spaces lined with differentiated glia cells comparable to the ependymal epithelium, but of the tumors into which such formation enters there were none in the twenty-five cases which have been studied.

"The third peculiarity of the gliomas as a class is the limitation of the tumor to the tissue in which it has originated. Even when rapidly growing, the growth is confined to the nervous tissue. It is remarkable to see the tumor growth involving the cortex over large areas and entirely supplanting this, but in no place extending into the adjoining meninges. It is true that the gliomata do in places, particularly in the sulci, extend into the meninges, but when this is the case the tumor at some point seemingly violently breaks through the tissue which

---

(8) Long Island Med. Jour., 1914, Vol. 8, p. 401.

confined it; a process, often small, extends into the meninges and from such a process the growth further extends. It is this apparent difficulty which the tumor has in growing outside of the nervous tissue which explains the absence of metastases. There seem to be no instances of metastases of the gliomas of the central nervous system. Some of the tumors may have the conditions favoring metastases consisting in abundance and loose relations of cells which have great capacity for growth. It is true that metastases by means of lymphatics cannot take place from the brain, for there are no open lymphatic channels communicating with the general lymphatic circulation, but the way by the blood is open, the glia cells are in certain tumors amœboid, they may penetrate the thin walls, and in one case of a glioma of the cerebellum I have found the tumor as a thrombus growing inside a vessel.''

The author furthermore discusses the occasional tendency of glioma to extend along surfaces. Thus in a child of 13 years he had seen a glioma originating within the pons which grew over it so as to resemble a mass of plaster poured over the surface. Attention is called to the method of cell division, which is usually direct and not by karyokinesis.

There are two principal varieties of glioma. The first is chiefly made up of reticular tissue, which encloses spaces filled with a homogenous coagulated material. Keeping in mind the comparison of the gliomata with the connective tissue tumors this group conforms to the type represented by the edematous fibroma. The second variety corresponds to sarcoma. It is mainly composed of glia cells and is very vascular. Hemorrhages and degenerations are common.

Aside from these two principal groups of glioma, Councilman in his series of 25 cases had encountered two instances of mixed tumor: One an ''angioglioma,'' the other a ''gliosarcoma.'' The latter was made up of two independent but interlacing types of tissue: one with the characteristics of cellular glioma, the other, also cellular tissue, arising from the walls of the numerous blood vessels and containing collagenous intercellular fibrils.

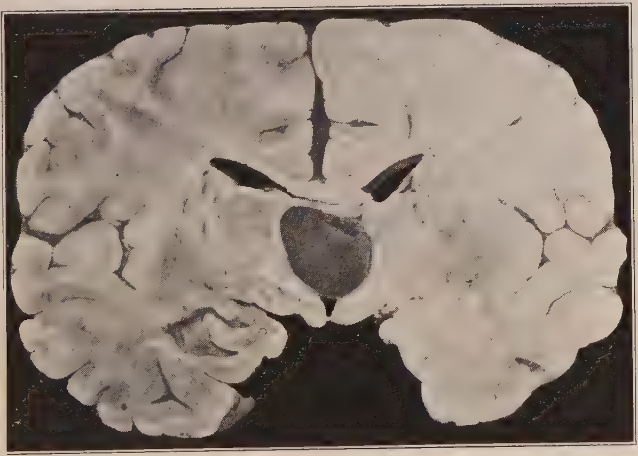
[It is gratifying that Councilman emphasizes the point that the term gliosarcoma should be used only for tumors like the one just described which are true mixed tumors consisting both of mesoblastic tissue (sarcoma) and epiblastic tissue as represented by the glia. There has been an unfortunate tendency to classify all highly cellular gliomas as gliosarcoma, but this shows lack of respect for the embryologic considerations. Such tumors belong in Councilman's second variety of glioma.—Ed.]

In the discussion of this paper Israel Strauss expresses approval of Councilman's restriction of the term gliosarcoma to mixed tumors. As to the question of cysts Strauss has come to the conclusion that all cerebellar cysts are gliomatous except the rare parasitic ones. The following remarks by Dr. Strauss on the possible relationship between trauma and glioma are of practical interest:

"Another interesting point from a clinical standpoint is the fact that these tumors go along very frequently quiescently until there is a hemorrhage and this gives us frequently the first indication of symptoms.

"I wonder, too, in this connection if Dr. Councilman has ever considered the effect of trauma upon these gliomata. I have in mind two cases in which the individuals were perfectly well, apparently, until they received a head injury. One of these cases immediately after the injury had convulsions, became delirious and, in fact, presented the picture of general paresis. Now the picture of general paresis was so prominent in this individual that one of the best neurologists of Philadelphia diagnosed it as a case of paresis. I subsequently saw the case and was able to obtain the brain at autopsy and it showed a tremendous tumor, occupying the region of both optic thalami as Dr. Councilman showed in one case. The individual was perfectly well, apparently, until this trauma and then these symptoms came on. That was a trial case, so that there came up the medico-legal question as to whether or not the tumor was caused by the trauma. I couldn't say that it was. I believe that the tumor was present there before the trauma. Whether the trauma stimulated it or not I do not know.

PLATE V.



Tumor of third ventricle.—Pollock (see page 89).

"Another case came to my notice where an individual apparently perfectly well, received a trauma, and again, in two weeks following that, symptoms developed strangely simulating general paresis in very many ways. The man died, and in that case there was a large tumor occupying the temporosphenoidal lobe, and here a glioma which was of the type that Stroebe first described, one containing a tremendous number of large astrocytes, was found. It is a difficult point to decide whether the trauma had any influence on the growth or not, but I think personally it might have had some. Dr. Councilman has called your attention to the fact that the glioma is an infiltrating tumor and that you find in these tumors that many of the myelin sheaths are preserved."

Tumor of the Third Ventricle. In the Practical Medicine Series, 1911, Vol. 10, p. 100, we called attention to Weisenburg's admirable review of the literature of tumors of the third ventricle, some 30 cases of which had been reported up to that time (1910). This year the subject is taken up by Lewis J. Pollock,[9] who begins by briefly summarizing the present state of our knowledge as defined by Weisenburg. Three symptomatic groups are distinguished:

1. Those cases in which a tumor of a moderate size is situated in the floor of the third ventricle, and in which there is no extension into the foramen of Monro or aqueduct of Sylvius.
2. Small tumors so situated as to obstruct the foramen of Monro and whose position can be changed by deviation of the head.
3. Those tumors, whether large or small, which either extend into the aqueduct of Sylvius, affecting the surrounding structures by direct extension or pressure, or those in which the posterior portions of the cerebral peduncles and pons are compressed, either by direct pressure or by dilatation of the aqueduct of Sylvius.

"The first class does not offer specific symptoms, but presents evidences of internal hydrocephalus, namely, headache, choked disk, nausea, vomiting and dizziness. In tumors of large size, indirect pressure on the internal

---

(9) Jour. Am. Med. Ass'n., June 5, 1915, Vol. 64, p. 1903.

capsule causes paresis of the corresponding limbs. These symptoms may likewise result from internal hydrocephalus alone. The reflexes are nearly always increased. The mental symptoms, generally supposed to be present in tumors of the third ventricle, are attributed by Mott to the impairment of the function of the cortex as the result of the pressure of the dilated ventricles.

"The second class is unimportant as but one case has been observed. This group presents a variation in symptoms of headache, nausea and impairment of vision on tilting the head forward.

"The third class offers a fairly well recognizable syndrome. The symptoms arise from involvement of the third nuclei, red nucleus, or superior cerebellar peduncles and from pressure on, or destruction of, the posterior longitudinal bundle or the intercommunicating fibres between the third nuclei. Among the symptoms noted are disturbance of associated ocular movements, oculomotor palsies, large pupils with impaired reaction, protrusion of the eyeballs, cerebellar ataxia, symptoms arising from pressure on the pineal gland and the general symptoms of tumor cerebri."

Pollock reports the following case in which the symptoms were not sufficiently typical to permit localization of the tumor during life. The patient was a single woman 48 years old, who was admitted to the Kankakee (Ill.) State Hospital in March, 1911. Her illness dated back to July, 1910, when it was noticed that her memory was becoming defective. She became stuporous, apathetic and somnolent, careless of her appearance, untidy and filthy. She had complained of dizziness and headache.

On examination it was noted that her gait was shuffling, the toes pointed outward. In walking she would bend backward, taking short steps with increasing rapidity, and she had difficulty in turning quickly. The right side of the body was slightly larger and the grip in the right hand was stronger than in the left (dynamometer right, 72, left, 50). Articulation was defective, slurring and lisping being present. Slight tremor of the fingers was present, not of the type of intention tremor, and more marked on the right side. Examination of sensation was unsatisfactory on account of the mental sluggishness. Pupils were equal and reacted normally. The knee jerks were increased, and ankle clonus was present on both sides; the abdominal reflexes were present on the left side and absent on the right side; a Babinski sign was not obtained. The spinal fluid was under increased pressure but gave a negative globulin test and showed no increase in cells. The further clinical notes are as follows:

Mental examination: The patient is quiet and entirely passive, saying and doing nothing spontaneously. She presents an appearance of fatuous contentment, frequently smiles inanely and takes no interest in her surroundings. She shows no distress concerning the involuntary bowel movements. She is entirely disoriented and does not grasp the meaning of the situation even when it is explained to her that she is in a hospital for the insane. She, however, seems to realize that she is not clear by saying that "things seemed confused," but does not react in any way suggestive of perplexity. Coöperation is poor and she often does not answer questions, apparently from lack of interest. Memory, as far as can be tested, is extremely defective, and she seems unable to retain any facts given as tests of impressibility. The general fund of information also seems to be very deficient. No sense falsifications or delusional trend can be discovered.

The main features are therefore those of extreme mental dilapidation, without any localizing signs on the part of the projection system.

June 2, 1911, difficulty in standing increased. Gait now resembled a continuous falling forward, with an attempt to regain equilibrium. Patient complained of headache occasionally. Memory defect increasing.

July 1, 1911, patient was unable to stand or sit up, and during this week became rapidly weaker. Greatest weakness appeared to be in the lower extremities. In replying to questions, the patient's answers were irrelevant. No abnormalities were noted in the ocular muscles, although frequently looked for.

July 13, 1911, death occurred.

The necropsy was limited to the brain and revealed an encysted colloid tumor situated in the third ventricle attached to the inferior surface of the center of the fornix and velum interpositum. It probably originated from the ependyma. It occluded the foramen of Monro and extended through it so as to protrude into the left lateral ventricle. The pineal gland was not encroached on. (See plate V.)

Microscopically the tumor was a glioma.

The author remarks that of the 30 cases of third ventricle tumor collected by Weisenburg only three extended into the lateral ventricles. This tumor, which occluded the foramen of Monro, whose position did not change with deviation of the head, which did not extend into the aqueduct of Sylvius, and which but slightly compressed the pons, would, according to Weisenburg's classification, be placed in the third group.

THE BASAL GANGLIA.

The Corpus Striatum and its Relation to Muscle Tonicity and Emotional Expression. The full title of an exceedingly valuable article by Charles K. Mills[1] is: "Muscle Tonicity, Emotional Expression and the Cerebral Tonectic Apparatus Considered Especially with Reference to a Case of Bilateral Caudato-lenticular Degeneration." The object of the paper is "to discuss some of the problems connected with affections exhibiting abnormal muscle tonicity and involuntary emotional expression from disease of the striatum and frontal cortex." The paper is largely based on the detailed study of the following case which Mills had observed for seven years:

A man 37 years old was first seen in April, 1906, and died in November, 1913. He gave a history of syphilitic infection in 1903 and of having drunk wood alcohol for two years prior to admittance to the hospital in 1906. Several months before he had suddenly developed a right

---

(1) Neurol. Centralbl., Dec. 16, 1914, Vol. 33, p. 1266. Printed in English. The paper had been intended for the International Congress on Neurology and Psychiatry in Bern which was abandoned on account of the war.

hemiplegia which only lasted a few days. On the day before admission he had a similar attack of transient paralysis on the left side. When admitted it was found that the right pupil was slightly larger than the left and both reacted to light. The left eye could not be turned outward and he could not open the left eye widely, nor shut it tightly. The left naso-labial fold was not quite so marked as the right and the patient was not able to smile or to draw up either side of his mouth. The patient's condition remained much the same during 1907, 1908 and 1909. He gradually failed, however, his failure becoming more marked in 1910 and 1911. His main symptoms did not change greatly during the entire period of his stay in the hospital except for the coming on of more complete helplessness, of more marked contractures and rigidity and of a mental condition in which he gradually responded less and less to his surroundings. Among the most striking symptoms were atacks of involuntary painful emotional expression. When asked to open his mouth or questioned in any way he at once burst into an involuntary distressing cry which increased in intensity, becoming a prolonged howl. The expression of his face during this period was one of pain but the existence of true emotion was doubtful. Hypertonicity was a marked manifestation and affected both the extremities and the trunk. The limbs were held in various stiff, rigid, awkward positions but could be straightened, even by the patient himself with effort, for several years. Eventually he became a stiff, ungainly mass, always confined to his bed. His lower extremities in these late periods exhibited a spastic tendency in the entire musculature, which resulted in the limbs retaining at times an almost straight position. At first he was able to walk, but his gait was very rigid and he walked on his toes and took very short steps. A marked tremor of the head and upper extremities was present. In January, 1907, the note was made that in sitting his head was sometimes held over the edge of the bed. While in this position he was either sleeping (which he did most of the time) or he was constantly moving his head and upper limbs. He turned his head from side to side and at the same time he repeatedly rubbed his hand on the bed, the movement sometimes being like that of pill-rolling. When told to touch his nose the finger would hover and tremble.

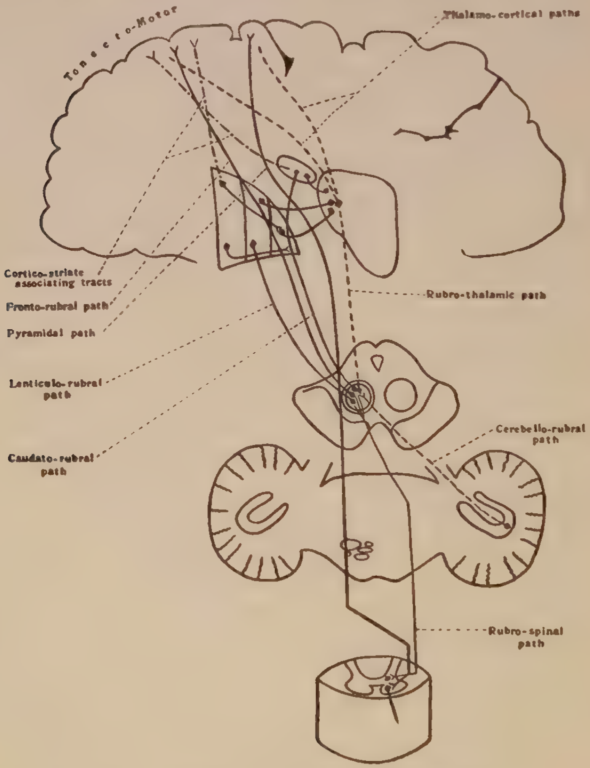


Fig. 1. Scheme of "Tonectic" Apparatus.

The speech was indistinct, not bulbar, but rather that of a person who does not want to make an effort or is too tired to speak. There was difficulty both in mastication and in deglutition. There was considerable mental dulness although he evidently comprehended more than his very stupid expression would indicate. Drooling of saliva and grinding of the teeth were constant features and during the last three years of his life he had frequent involuntary evacuations. The deep reflexes were very marked but there was no clonus and no Babinski sign and the abdominal reflexes were present. Sensation was normal. (See plates VI-VII.)

At the necropsy the brain was extremely edematous and the lateral ventricles were bulging and enlarged on account of the excessive amount of fluid. A horizontal section just below the corpus callosum passing through the upper part of the optic thalamus showed an old area of sclerosis and softening in the lower part of the right ascending parietal convolution, the posterior half or a little more of the island of Reil and the tip of the first temporal convolution. The anterior horn of each lateral ventricle was much enlarged. The head of the right caudate nucleus and the anterior limb of the right internal capsule had disappeared. The head of the left caudate nucleus was much atrophied. The anterior limb of the left internal capsule was intact. A second horizontal cut was made half an inch below the first. At this level there was an area of sclerosis on each side, nearly symmetrical, involving the anterior part of each lenticular nucleus. The posterior horns of the lateral ventricles were not distinctly enlarged.

The author believes that only a small percentage, probably less than ten per cent., of the entire symptomatology was due to lesions in the pyramidal system and chiefly consisted of paresis of the left side of the face and of the left arm.

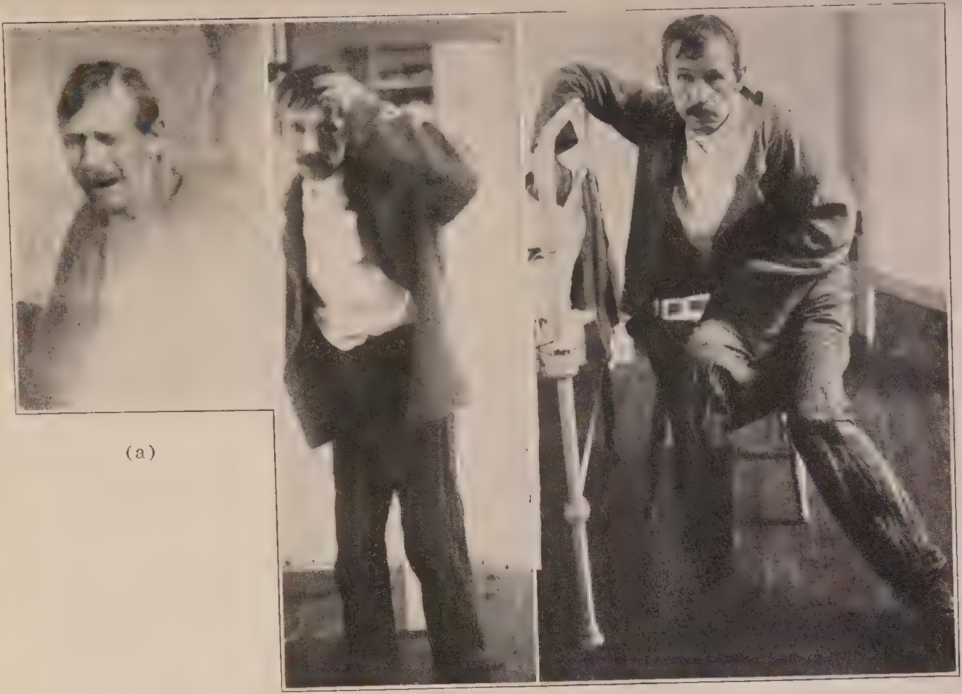
"The motor extra-pyramidal symptoms will be seen on examination to have for their keynote muscular hypertonicity. Little or no discussion of the question of hypertonicity is necessary in considering such evidently hypertonic phenomena as spasticity, rigidity, contractures, perseveration in forced attitudes, in which hypertonicity is evident. Involuntary painful emotional expression, so dramatic a feature in this case, like involuntary agreeable emotional expression so often observed in lenticular degenerations, is also a symptom of hypertonicity, at least in large part. The expressions, 'spasmodic laughing' and 'spasmodic weeping,' as descriptive of these cases, are correctly used. Tremor is a phenomenon of unstable or irregular tonicity. True impairment of power while unquestionably present was hard to measure and to interpret. Perhaps it might be regarded as an affective motor rather than a voluntary motor paresis, the withdrawal of emoto-tonic excitations lowering the energy and interfering with synergy of movements, as will appear more clearly when the cerebral tonectic apparatus is discussed. The dysarthric and dysphagic disturbances were in part at least manifestations of hypertonicity."

"*The cerebral tonectic apparatus.* A comprehensive recall of the symptomatology of the case just presented shows that hypertonicity and painful emotional expression, the latter being largely due to abnormal muscle tone, are the chief features which invite discussion. The abnormal phenomena exhibited are referable to lesions of what might be termed the affective motor in contradistinction to the voluntary motor apparatus. As these phenomena are chiefly concerned with cerebral tone, the term 'tonectic' has been chosen as the most descriptive designation.

"A degree of atonia is sometimes present as a result of cerebellar lesions, but this fact can be explained without assuming that tonus is a fundamental cerebellar product, as held by Luciani. The three essential qualities of motor innervation are energy, tone, and synergy. Tone is necessary for the rhythmetization both of voluntary and involuntary movement; synergy in order that toned movements shall be grouped for the performance of acts which require special adjustments. Tone integrated in the striatum unites with cerebellar synergy through the intermediation of the cerebello-rubro-thalamo-cortical apparatus and the cerebello-rubro-spinal apparatus. If the cerebellar influence is withdrawn, asynergic movement is the consequence. If the tonectic excitations from the striatum are withheld, hypertonicity and involuntary movement result.

"Tone, at least in the human being, is not a spinal

PLATE VI.



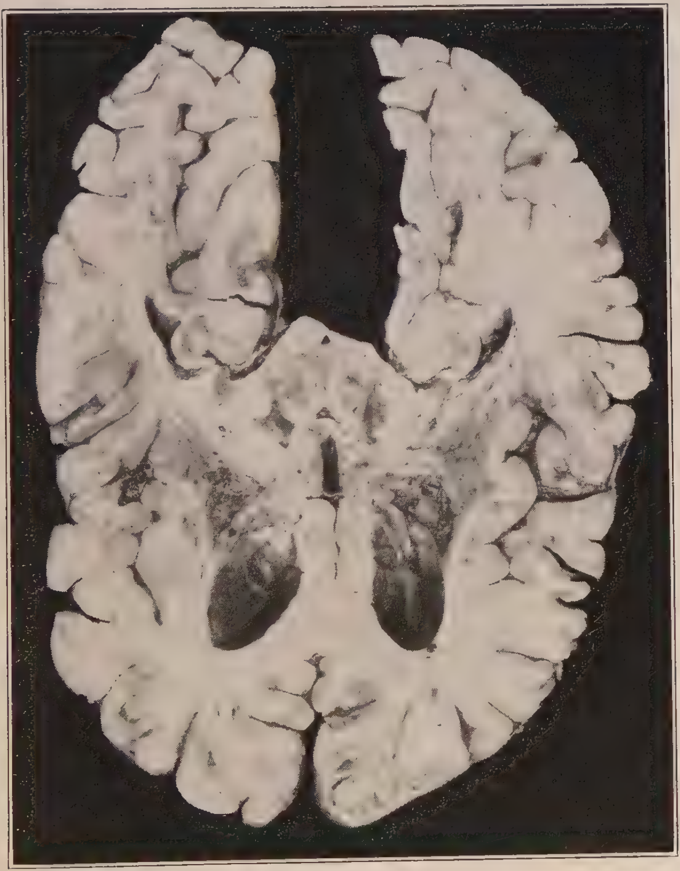
(a)

(b)

(c)

Bilateral lenticular degeneration. (a) Expression of anguish with howling; (b) and (c) showing attitude of patient.—Mills (see page 92).

PLATE VII.



Bilateral degeneration of lenticular nuclei.—Mills (see page 92).

or cerebellar attribute, but belongs to the cerebral cortex, becoming more cortical, as Crocq has shown, as we ascend from lower animals in the scale, the frog, the dog and the ape, for instance, to man. That the cortex of the cerebrum is the seat of tone is not a new idea. It has been held by many, the views of those expressing the theory, however, being somewhat diverse. In most instances the pyramidal motor cortex seems to be regarded as the rendezvous and storehouse of the tone derived from sensation and idea. The cerebral tonectic apparatus, I believe, is structurally separate from the motor projection systems. It has special cortical areas of representation, and these are connected by fibre systems with the sensorimotor executive apparatus on which tonectic excitations exert their influence. Regarding the frontal cortex from the central fissure to the anterior pole of the brain, as subdivided into a prefrontal, a midfrontal, and a postfrontal (motor) region, the cortical tonectic zone is chiefly midfrontal. The striatum is an association or integration region where are grouped the excitations from the differentiated cortical centers for tone. Wilson holds that higher (cerebral) centers concerned with tone must be conceded and that there is increasing evidence that muscular tone depends to some extent on the reaction between the basal ganglia and the cortex and especially the intermedio-precentral cortex.

"The midfrontal or intermedio-precentral region is the cortical seat or rendezvous of tone, the place to which stream the effects or tone impulses of the sensory centers of the cortex. Separate cortical tonectic centers constitute together a cortical tonectic zone. This area is not necessarily topographically entirely segregated from the pyramidal motor cortex. Each motor center probably has its separate outlying cellular tonectic annex or dependency, these centers of tone lying in the main anterior to the motor centers proper. As most of the pyramidal motor system is represented in the postfrontal region, chiefly in the precentral convolution, the tonectic centers are mainly located anterior to this convolution. Scattered over the midfrontal region, however, are some pyramidal motor centers, as I have demonstrated with Dr. Charles H. Frazier by faradization of the midfrontal and prefrontal region of the human brain. Here movements of the jaw have a wide representation, and here in a region several inches cephalad of the central fissure are centers concerned with movements of Darwin's muscles of grief, movements of the orbiculars of the eyelids, the pyramidals of the nose, the corrugators, and the inner fascia of the frontals. Somewhat in advance of the precentral convolution are also represented such movements as turning of the head to one side, forward bending of the head, and closure of both eyelids. Nevertheless, the major portion of the midfrontal cortex is nonexcitable by the electrical current, as are the pyramidal motor centers. The nonexcitable centers are concerned with the maintenance of tone.''

Mills finds records of observations which support the view that the midfrontal region is especially concerned with tonicity. Thus in a case reported by Massalongo, with many types of abnormal movements, there was a tuberculous meningitis affecting especially the frontal lobes of both hemispheres, and in a case of Schaffer with spasmodic laughter there were softening and atrophy of the right frontal lobe. Mills himself has observed convulsive attacks with a smiling or laughing aura in a case of extensive destructive disease of the right midfrontal and prefrontal region. According to Mills it is generally accepted that morphologically the corpus striatum is a part of the cortex. ''It is probable that the best solution of the problem of the functions of the striatum, both caudatum and lenticula, is to be found in the assumption that physiologically as well as morphologically this basal ganglion, so-called, functions like a region of the cortex. Just as primary and secondary cortical visual and auditory centers and areas are recognized, and in the same sense that the frontal insular speech center may be regarded as a special cortical association center, so the striate nuclei may be looked upon as cortical regions closely related in function with the midfrontal and a part of the prefrontal cortex. Regarding the latter as a region where differentiated tonectic centers have their seat, the striatum is probably a cortical area where these differentiated centers are integrated."

Is the Corpus Striatum a Purely Vestigial Organ and Devoid of Function? Another Philadelphia neurologist, James Hendrie Lloyd,[2] so concludes after a review of the embryology and comparative morphology of this organ, particularly as discussed in the works of Gaskell. His somewhat radical, or rather nihilistic views, even if wrong, are so well set forth and so bristling with useful ideas as to merit attention. His main theses are:

"From this review of the morphology of the corpus striatum I am led to the opinion that the striate body in the human brain is a vestigial organ, representing the original fore-brain mass in the earliest ancestral types of the vertebrates. It is a little played-out fishes' brain, a submerged brain broken into two fragments, lying deep in the cerebral hemispheres, which have been developed over it in the original pallium, or membranous wall of the fore-brain vesicle, and have completely usurped its functions and added immensely to them. The difference between the two is the difference between the human brain cortex, on the one hand, and the supra-esophageal ganglion of a crab or spider, on the other hand. They lie at the extreme poles of the evolution of the nervous system.

"The bearing of this demonstration on pathology remains to be discussed—but time will only allow me to make a brief statement of my views in a few general propositions. I have gone over a series of 10 or 12 brains in my own collection at Blockley, but I do not intend to bore you with case reports.

"First, I hold broadly that the symptoms caused by lesions of the lenticula are the symptoms merely of various affections of the fibers of the internal capsule. There is no such thing as a lenticular syndrome properly so-called.

"Second, the lenticula derives its sole importance in

---

(2) Jour. Nerv. and Ment. Dis., June, 1915, Vol. 42, p. 370.

these cases from its contiguity to the internal capsule, and from the blood-vessels which run into and through it—vessels which are very prone to be the seats of hemorrhage or obstruction.

Third, when such lesions occur on both sides (that is, when both lenticulæ are involved), especially in progressive or successive attacks, there is produced the condition known as pseudobulbar palsy, which is properly a bilateral capsular syndrome. Nothing is to be gained by renaming it 'progressive lenticular disease,' because the mere renaming of a thing does not add a whit to our knowledge of it.

"Fourth, pseudobulbar palsy has many varieties, and not a few aliases, but its main features are dysarthria, dysphagia, automatic emotionalism, and various affections of the motor paths to the upper and lower limbs. These motor paths may be partially or almost completely paralyzed, or only paretic, and the limbs may exhibit various motor disorders, such as tremor, spasticity, athetosis and even incoördination. These varieties depend upon the degree of involvement of the motor fibers in the internal capsule, whether they are totally paralyzed, partially paralyzed, or irritated and in other ways disordered in their functions and nutrition by a disordered blood supply. There is no proof that one set of fibers is needed to keep another set of fibers in tone; it is more probable that a deranged blood supply accounts for the various freaky symptoms which are seen in these cases. The reflexes may or may not be affected, according to the degree of involvement of the pyramidal tracts.

"Fifth, dysarthria in these cases is caused by involvement of the motor tracts in the capsule running from the cortical speech centers above to the pontobulbar nuclei below. The facio-oro-lingual center in the brain cortex is probably located near the foot of the ascending frontal gyre, but the exact position of its descending tracts in the internal capsule is not so definitely known; they are probably placed well forward in front of the knee. The claim that the striate body may be a coördinating center for speech is to my mind entirely fanciful, and is discredited by the morphology and phylogenetic place of that body. It is inconceivable that the fishes' brain could have any speech function. Speech is a function of the human brain cortex alone—one of its highest specialized functions. To place any part of it in the striatum is to go counter to all the indications of morphology. It is only the descending tracts from the speech centers in the cortex that are involved in these cases.

"Sixth, the mechanism of automatic laughter and weeping is not readily explained, but to attempt to explain it by arbitrarily locating an emotional center in the basal ganglia is, in view of what we have just seen, positively grotesque. Emotion is a form of ideation; it is a cortical function. I grant that if a fish ever laughed, it must have laughed with its corpus striatum; it had nothing else to laugh with; but I do not believe that a man laughs in that way. I have attempted elsewhere to explain this automatic emotionalism by suggesting that it is strictly analogous to other automatic phenomena, as, for instance, the action of a decapitated frog in wiping off a drop of acid from the skin of one leg by using the other foot; or the action of the decapitated rattle-snake, which, if its tail is trodden on, will raise its headless trunk and strike. The various nuclei of the many muscles concerned in the act of laughter have become trained to a coördinated action. They may go off, as it were, by themselves when they are cut off from the controlling centers in the brain cortex; and this condition is well presented by lenticular lesions involving the capsule, when such lesions are bilateral."

Pseudosclerosis. This obscure affection, first described in 1883 by Westphal, is the subject of an article by H. Oppenheim,[3] who begins by saying that its study has entered upon a new stage since Wilson discovered the symptom complex of progressive lenticular degeneration [See Practical Medicine Series, 1912, Vol. 10, p. 91.], since Fleischer [ibid, p. 98] and others described abnormal pigmentation and atrophy of the liver

---

(3) Neurol. Centralbl., 1914, Vol. 33, p. 1202.

as new symptoms, and since v. Hösslin and Alzheimer have demonstrated definite anatomic changes of typical localization, chiefly in the basal ganglia. Recently there has been much discussion of the relationship between the changes in the liver and brain, of the origin and nature of the pigment, of the relationship between pseudosclerosis and Wilson's disease, and that of both these affections to bilateral athetosis and paralysis agitans.

Oppenheim relates the following cases:

Case I. Without discoverable cause a man, 27 years old, developed slow tremor and unsteadiness of the extremities, more on the right side; tremor of the head, slowness of speech, increased tendon reflexes, and abnormal pigmentation of the periphery of the cornea. The liver dulness was diminished and the spleen was enlarged. Aside from complaining of impaired memory, the patient showed no mental abnormalities. The tremor, like that of paralysis agitans, was present at rest but increased on active movements and by mental excitement. It was slow and affected the right arm to such an extent that writing was impossible. The speech, in addition to being slow, was slightly nasal. The case is considered one of little advanced pseudosclerosis in which the mental symptoms as well as the epileptiform and apoplectiform attacks are lacking.

Case II. A previously healthy girl 18 years old developed a tremor of the right hand which disturbed her writing and piano playing. It increased from year to year, although with remissions, and gradually involved the other extremities, especially the left arm and the musculature of the neck. After an automobile accident the tremor grew worse and speech disturbance set in. A month after the accident she was married and the tremor soon involved the whole body to such an extent that she could not eat, walk or stand without help. Psychic symptoms developed: irritability, displays of anger, spells of weeping and laughing; later compulsive screaming, urticaria and dermographia were observed. The characteristic peripheral pigmentation of the cornea, decrease in size of the liver and enlargement of the spleen were present. The family history is interesting. The father had died of syphilis of the nervous system, the mother of carcinoma of the liver. An older sister had a similar nervous disease, to be described; one died immediately after birth, one was still-born.

Case III. The patient, 25 years old, is the sister of the one just described and was treated by Oppenheim in 1899. He then made a diagnosis of multiple sclerosis but is now of the opinion that this also was a case of pseudosclerosis. At the age of 20 years the right hand became affected by a light tremor which in a few years involved also the left hand and the head. She gradually failed mentally and the speech became slow and scanning. The tremor was greatly increased on voluntary movement. The legs were weak and the pupils reacted rather sluggishly to light. Frequent micturition was complained of. The Wassermann test with the blood was negative and there was no relief from antisyphilitic treatment.

Oppenheim places the pseudosclerosis and Wilson's disease in the same group. Wilson lays stress on the extra-pyramidal character of progressive lenticular degeneration, and this in the main is true of pseudosclerosis, in which the pyramidal system is only occasionally slightly involved.

The relation between the brain disease and the liver affection can only be surmised. That the latter is the result of the former is not reasonable to assume. Wilson's suggestion that the liver disease produces toxic substances which in a selective manner affect the basal ganglia is much more plausible. This action may be facilitated by hereditary or other toxic influences which may explain the occasional familial occurrence of the disease. The corneal pigmentation is a valuable diagnostic symptom, but Oppenheim does not consider its presence essential for a diagnosis.

Three cases resembling pseudosclerosis and progressive lenticular degeneration are reported by William B. Cadwalader,[4] two brothers and a sister. The patients

---

(4) Am. Jour. Med. Sci., Oct., 1915, Vol. 150, p. 556.

stated that they came of healthy Irish stock, their parents having been people of good habits; that they themselves had not previously suffered from any disease and that, prior to the onset of their present malady, they had always been able to follow their occupations. Venereal disease was denied.

Case 1. Male, aged 42 years. When 32 years old he noticed a tremor in the right arm; later the left hand became involved, and soon the legs began to feel stiff. Six to ten months after the onset, he had to give up work, and since then the stiffness of the legs has gradually increased. The palpebral fissures were widened, giving the face an expression that might be described as one of astonishment. There was a slight but constant tremulous movement of the head on the trunk, and marked tremor of the extremities and trunk. The tremor of the upper extremities was somewhat more pronounced on the right side and on both sides it was greater in the distal portions. It was a constant to and fro rhythmic flexor and extensor movement which never ceased entirely, and it was always increased by emotion and by muscular effort. The lower extremities were spastic and tremulous, the tremor being more marked in the thighs than in the distal parts. The patient was able to walk short distances with the aid of a cane, but the effort caused a general increase of the tremulous movements throughout the body and extremities and as a consequence he rapidly became exhausted. The knee and ankle jerks were increased but there was no Babinski sign. There was no mental disorder except for a certain irritability and lack of initiative.

Case 2. Female, aged 38 years. The tremor appeared at the age of 34 years and the legs rapidly became stiff. The tremor involved the jaw, head and extremities and in addition to the stiffness of the legs there was an element of incoördination. The condition of the reflexes was similar to that of the previous patient. Sensation normal, mentality normal.

Case 3. Male, 34 years old. Onset with tremor at 32 followed by stiffness in the legs. No speech disturbance and no tremor of the jaw or face. The tremor of the hands was not unlike that of paralysis agitans and was not increased on voluntary movement. The reflexes were only slightly increased.

The author states that the difference in symptoms presented by these cases from those of progressive lenticular degeneration was indeed indefinite, for the condition appears to have been a family affection, very slowly progressive in character, but appearing at a later age than in Wilson's cases. Diminished liver dulness and corneal pigmentation were not present. The degree of spasticity was slighter than in Wilson's cases but the tremor seems to have been almost identical in character. It has been pointed out by Strümpell that in pseudosclerosis the tremor is more conspicuous than the spasticity, whereas in lenticular degeneration the spasticity and contracture are more marked than the tremor. On the whole the condition in the cases described resembles very closely the accepted disease picture of pseudosclerosis. The author concludes by saying that considering both the clinical and pathological evidence now at our disposal it would seem not at all unlikely that in the near future pseudosclerosis and progressive lenticular degeneration may be proved to be merely modifications of the one disease.

The Changes in the Liver in Pseudosclerosis and Progressive Lenticular Degeneration are made the subject of a special study by A. Kubitz and M. Staemmler,[5] based on the literature and on personal examination of one case of pseudosclerosis and one of a transitional form between the two diseases mentioned. Conflicting views are held: 1. The liver alteration is due to an embryonal malformation. The increase in connective tissue is not attended with evidence of inflammation or of regeneration. (Rumpl; O. Meyer.) 2. The alteration is due to a peculiar form of nodular hyperplasia, secondary to necrotic processes in the parenchyma. (Yokoyama and Fischer.) 3. It consists of a cirrhosis which is chiefly multilobular with a large number of bile ducts, attended with necrosis and fatty and other degenerations of the

---

(5) Beitr. z. path. Anat. (Ziegler's), 1914, Vol. 60, p. 76.

parenchyma. (Wilson; Homén.) 4. The possibility of a pigmentary cirrhosis has been suggested by Benda.

The present authors find abundant signs of chronic inflammation and regeneration and look upon the condition as one of cirrhosis. They are not as certain as is Wilson that syphilis plays no part. They do not believe that the liver changes are caused by the brain disease nor do they agree with Wilson's hypothesis that the liver may produce a toxin which has a specific action on the lenticular nucleus. On the other hand they believe that both the brain and liver changes are produced by a common yet unknown cause. We are reminded how syphilis frequently affects both of these organs.

THE PINEAL BODY.

The Histology of the Pineal Body. After working five years on this subject a Dane, K. H. Krabbe,[6] publishes a monograph in which the reader will find an authoritative discussion of all available facts and theories concerning this mysterious organ. Naturally, the embryology is first considered and then the morphology of the mature organ. Krabbe lays stress on the importance of using various fixing and staining methods and on the necessity of studying the organ at different ages. By omitting the latter a previous investigator missed the fact that at the age of eight or nine years the pineal cells begin to excrete pyroninophil granules from their nuclei. Three main types of cells are met with: (1) pineal cells; (2) glia cells; (3) nerve cells. Each type appears in several forms but the types remain distinct and do not pass one into the other. The pineal cells form the bulk of the parenchyma; they are more or less rounded, their nuclei are poor in chromatin and very irregular in shape.

"The last sixteen pages of Krabbe's thesis deals with biological considerations. He remarks that the pineal body has been considered to be a gland from the days of

---

(6) Histologiske Undersögelser over Corpus Pineale. 112 pages, with 47 illustrations. Copenhagen, 1915. Abstract in Rev. Neurol. and Psych., 1915, Vol. 13, p. 300.

Galen, and that at the present time it has received much attention from theorists as being one of the endocrine glands; it has also been regarded as a lymph gland, as a nervous organ, and as a degenerated rudimentary organ without function in man. Krabbe says that there is no reason to suppose that it is a glial organ, or that the small amount of glia in it differs in function from the similar glia that forms so large an amount of the central nervous system. Its nerve cells are not sympathetic in origin; their growth-knobs, similar to those seen around the so-called Redlich-Fischer plaques, supposed to be signs of senile involution, may perhaps be analogous to nerve endings in muscles and tendons. The true pineal cells are unlike any other cells in the human body; during fetal life and the first year they exactly resemble the neuroblasts found throughout the fetal brain. Later they undergo the metamorphosis described above, and in addition present the phenomenon of the extrusion of basophil nuclear granules without change in their shape. They have no processes and so cannot be regarded as nerve cells or glia cells in the ordinary sense of those terms. Krabbe discusses the question of regarding the pineal body as a gland with an internal secretion; the best argument for this view he finds in the fact that the pineal cells show numerous amitotic divisions in process, and the excretion of nuclear granules may also be taken as evidence of a glandular character. Histological research can hardly settle the point. Ablation experiments have left the function of the pineal gland doubtful, and have not determined any certain connection between the gland and the genital apparatus. The effects of injection of pineal extracts Krabbe dismisses in eight lines as interesting but quite inconclusive (p. 76). Clinical observations indicating the gland's functions were first brought thoroughly together in 1908 by Marburg. Up to the present time about 70 cases of pineal tumor have been recorded and in 5 of these premature development of the sexual organs has been noted; in a few others the patient has shown obesity. At first Marburg attributed the premature sexual development to hypopinealism, the obesity to hyperpinealism; more recently he and certain Italian observers have limited themselves to the conclusion that the pineal body is an organ with an internal secretion that regulates the development of the secondary sexual characteristics. Krabbe deprecates hasty speculation as to the function of the normal pineal body based on these few exceptional pathological cases; the most he is willing to deduce from them is that the effects of pineal tumors may exhibit analogies with those of tumors of other organs with internal secretions. From the point of view of comparative anatomy, Creutzfeldt (1912) has pointed out that the pineal body is best developed in ruminants and horses, but absent in seals, dasypus, halicore, elephants, the rhinoceros, the mole, etc., and he connects its presence with the possession of a relatively thin skin.

"Krabbe finally develops his own view that the pineal body may have a sensory function, that of regulating and keeping constant the pressure of the cerebrospinal fluid secreted by the ependyma of the choroid plexuses; this view, as he says, was indicated by Galen, substituting the word 'spiritus' for 'cerebrospinal fluid.' Flesch (1888) had supposed that it might regulate the production of heat; Walter (1913) described it as a sort of reflex organ, and in 1914 wrote of it as a regulator of the pressure of the cerebrospinal fluid. Krabbe says that the human pineal body is phylogenetically not homologous with the parietal eye of saurians, but is homologous with that of cylostomes, following Studicka (1905); he thinks that there is not yet enough evidence to show whether the sense organ theory or the internal secretion theory of the pineal functions is the best. He does not think that the pineal body can properly be described as a rudimentary organ, and finds nothing to suggest that it is degenerating or functionless, or even in a state of involution; the calcareous pineal concretions taken by certain writers as evidence of involution or degeneration are compared by Krabbe to the similar concretions found in the membranes of the brain, and he connects both with the cerebrospinal fluid, and particularly with variations in its pressure. Excess of connective tissue may be marked at the age of 12 and absent at 92, as he points out; hence, it is impossible to argue that the increasing fibrosis of the pineal body usual with advancing years is evidence of involution. He prefers to say that the pineal body shows signs of a lack of balance rather than of involution; the concretions, glia-placques, fibrosis, nerve end-knobs, and nuclear excretion are to be taken as evidence of unbalanced activity of the various elements composing the pineal body, possibly due to variations in the pressure of the cerebrospinal fluid."

THE HYPOPHYSIS.

Pituitary Tumor with Improvement after Puncture of the Corpus Callosum. William M. Leszynsky[7] reports the case of a boy 17 years old who gradually developed failing vision, general mental and physical weakness, drowsiness, continual yawning, increased hunger and thirst. He was very fat, the skin was dry, there was very little pubic hair, and the genitalia were undeveloped. Vision in the right eye was reduced to mere light perception and was 20/100 in the left eye. Optic atrophy was present. The knee jerks were increased and ankle clonus and positive Babinski sign were present on both sides. The carbohydrate tolerance was increased as the patient could ingest from 250 to 300 gm. of levulose without the appearance of sugar in the urine. In other words the case was a typical one of the so-called Fröhlich's syndrome, and a diagnosis was made of hypophysis tumor with internal hydrocephalus. On May 13, 1914, the corpus callosum was punctured for the purpose of establishing permanent subdural drainage and about 60 c.c. of cerebrospinal fluid withdrawn. In the course of 10 days the headache, vertigo, vomiting, exaggerated knee jerks, ankle clonus and the Babinski sign had entirely disappeared. One month after the operation the vision had improved to 20/70 in the left eye and the patient could see shadows at 1 ft. with the right eye. By April, 1915, vision in the left eye was 20/40, field normal, and with the right eye shadows could be seen at

---

(7) New York Med. Jour., Aug. 28, 1915, p. 435.

3 ft. None of the symptoms of intraventricular distension has returned. The mental condition has improved. The patient has remained in good health and is employed daily, carrying heavy baskets without unusual fatigue. The objective signs of hypopituitarism such as hypotrichosis, infantile genitalia and obesity, have remained unchanged.

Hypopituitarism in Chronic Hydrocephalus. Lewis J. Pollock[8] states:

"Disorders of pituitary metabolism may be due to disturbances of the gland itself, organic or functional, as tumors, hyperplasia, hypoplasia, etc., or such changes may be the result of remote factors, such as distant tumors pressing on the gland, and hydrocephalus. In severe hydrocephalus, the third as well as the other venticles is distended with fluid; it becomes cystic, bulges, and presses on the underlying pituitary gland." Cases of this sort have been reported by Marinesco and Goldstein and in his recent book Cushing remarks on the scarcity of literature and calls attention to 20 preadolescents with tumor of the cerebellum and chronic hydrocephalus, all being well nourished and many quite adipose. He likewise reports one case of essential hydrocephalus with hypopituitarism, one case of cerebellar cyst with hydrocephalus and hypopituitarism and one case of endothelioma of the right hemisphere, hydrops of the third ventricle and hypopituitarism. In his text book Oppenheim states that he has seen two cases of cerebellar cysts with secondary hydrocephalus causing symptoms of acromegaly. In 1913 Pollock[9] reported a case of hypopituitarism in chronic hydrocephalus and since then he has observed 12 additional cases. In all the cases adiposity was the predominating feature. Genital hypoplasia was observed only once. All the patients showed a delicate, pudgy, tapering hand with broad base. Increased carbohydrate tolerance was found in all of six cases so studied.

In the present paper Pollock reports one case with necropsy and makes brief mention of three others.

---

(8) Jour. Amer. Med. Ass'n., Jan. 30, 1915, Vol. 64, p. 395.
(9) Institution Quart., 1913, Vol. 4, p. 67.

Case 1. A man 40 years old was admitted to the Kankakee (Ill.) State Hospital in November, 1905. He was said to have had meningitis at the age of 4 months and after he recovered it was noticed that he was deaf. He did not walk until he was 9 years old and mentally he did not develop beyond the equivalent of seven years. It was noted that while a young man he was fat, that his head was somewhat large, that the penis was very small and at the age of 18 the testicles "apparently disappeared." This condition was explained by the relatives as being the result of their being hidden by the excess of fat. He did not develop hair as did other men. A tin-type taken at age 18 shows a very fat boy with a large head. He had never complained of headache, nor did he vomit. When admitted to the hospital at the age of 40 he was 5 ft. 6 in. tall and weighed 278 pounds. He was very fleshy; the skin was soft and moist, the mucous membranes red and muscles flabby. The hair on the head was dark and thin. In the axillae the hair was sparse, and very thin over the pubes. The abdominal wall was protuberant. There was a moderate umbilical hernia and so large an amount of fat that the abdomen hung over the thighs like an apron, concealing the penis. The head was large and hydrocephalic, the tongue normal. Several teeth were missing. Examination of the chest showed the lungs to be negative. Heart action was rapid, the first sound loud. Abdomen showed dilated colon. The genitalia were notable for the atrophic penis and partially descended testicles. The penis was about 1¼ inches long, small in caliber, hidden by fat. Reflexes, deep and superficial, were normal. Pupillary reflexes were normal.

In this case, therefore, the notable features are hydrocephalus, adiposity, lack of hair and genital atrophy. The patient was quiet and tractable, possessed little memory, performed very few functions and even needed assistance in feeding. He was untidy, soiling and wetting himself, and made no effort to attend to the calls of nature. He frequently laughed loudly without cause and took no interest in his surroundings.

Aside from the steady decrease in weight there was noted no change in the condition of the patient after admission. There was no gross change in vision, but he became more and more unsteady in his gait. He was found dead in bed, Oct. 25, 1911.

Necropsy.—Post mortem examination revealed an umbilical hernia, dilated colon with displacement upward of the thoracic contents, edema of the lungs, moderate general arteriosclerosis, fatty degeneration of the liver, chronic parenchymatous nephritis, colloid goiter, general adiposity, partially descended testicles and an infantile penis. The ossicles of the ear were quite small. The skull was thin. The brain was markedly hydrocephalic. (Plate VIII, B.) It is particularly interesting that the pituitary body was found to be flattened by the pressure exerted by the distended ventricles and its posterior lobe showed increase in fibrous tissue. The pineal gland was surrounded by increased fibrous tissue.

Case 2. Girl, aged 11, height 4 ft. 8 in., weight 127 lbs., an overdeveloped, very obese child with tapering hands; was an idiot who could not talk; the pubic hair was well developed. Roentgenoscopy revealed a normal sella turcica, but a hydrocephalic skull.

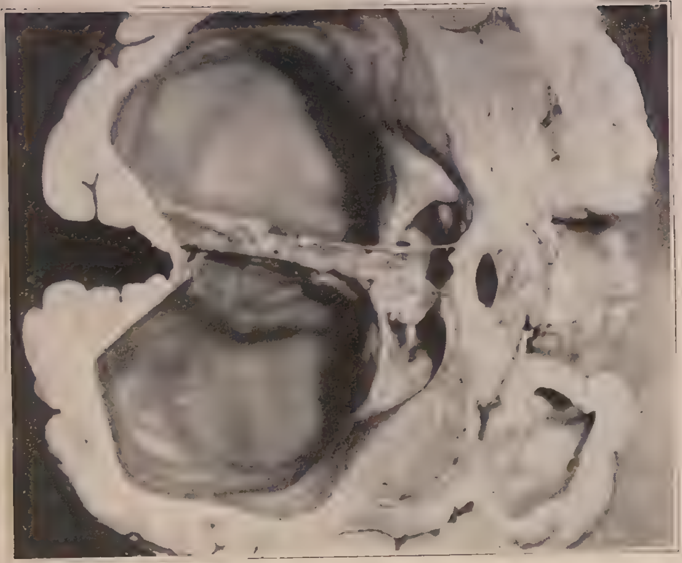
Case 3. Woman, aged 19, had an attack of meningitis at age of 7 weeks, and has never walked or talked. She has a marked hydrocephalus and spastic diplegia. She has atypical epileptiform attacks, is very obese and has tapering hands. Menstruation is irregular. (Plate VIII, A.)

Case 4. Woman, aged 25, has a marked hydrocephalus. She is an idiot with spastic diplegia, is exceedingly obese and has tapering hands. Menstruation is irregular.

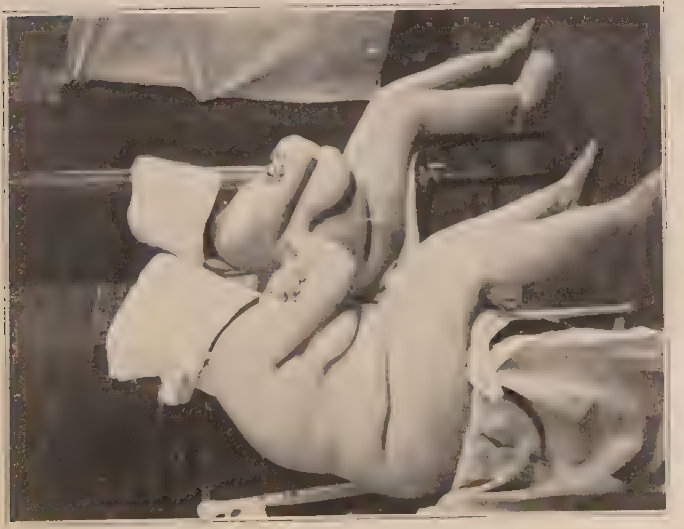
In his concluding remarks Pollock states that "the purpose of this report is simply to call attention to the frequency of the association of hypopituitarism with hydrocephalus and by a few illustrations recall to memory many similar cases observed by all physicians.

"The similarity of serous meningitis to tumor cerebri is well known and the inclusion of pituitary symptoms may lead to a diagnosis of tumor of the hypophysis, wrongly. The involvement of the pineal gland in the mechanical injury resulting from a cystic third ventricle

PLATE VIII.

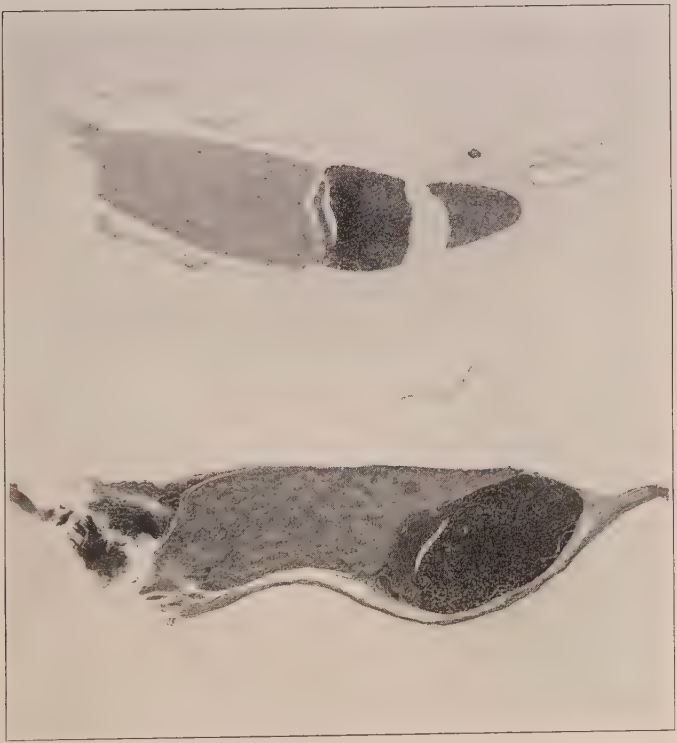


B. Hypophysis (x) beneath the floor of the cystic third ventricle. Case 1.—Pollock (see page 110).



A. Hypopituitarism in chronic hydrocephalus, Cases 3 and 4.—Pollock (see page 110).

PLATE IX.



(a) Median section of pituitary gland of hibernating woodchuck killed Feb. 15, 1913. Pars anterior broken.
(b) Median section of pituitary gland of woodchuck killed March 22, 1913, a few days after awakening.—Cushing and Goetsch (see page 113).

deserves further study in its relation to cerebral adiposity."

Hibernation and the Hypophysis. Harvey Cushing and Emil Goetsch[9] state that hitherto the lethargy of the hibernating stage has been attributed to two extracorporeal factors, namely, low external temperature and diminished food supply. However, such attempts as have been made to determine the influence of these factors under experimental conditions have given results which are not entirely convincing. The authors find that none of the explanations hitherto offered is satisfactory and their purpose is to show that a seasonal wave of physiological activity on the part of certain glands of internal secretion may well account for the phenomenon of hibernation. Experimental hypophysectomy has been known to cause a profoundly lethargic state, with marked lowering of body temperature and in the fatal cases the temperature often fell to that of the surrounding medium, rectal registrations of 20° C. being not uncommon. Cushing and his fellow workers noted that in the case of animals subjected to a nearly total extirpation, a pronounced lethargy with coincident fall in body temperature was more apt to supervene in the winter months than after similar operations in warmer seasons. In addition to the persistent and often extreme lowering of body temperature, it was observed that respiration became shallow and slow, in some cases registering only three or four respirations a minute, that the pulse rate was usually retarded, that the blood-pressure was very low, and that there was a peculiar insensitiveness to external painful stimuli. It was found that injection of hypophysis extract was the most effective means of raising the body temperature and improving the general condition.

The authors had the opportunity of studying the ductless glands of seven woodchucks (the North American marmot, Arctomys monax or marmotta monax). It was found that during the dormant period histological changes occurred in many of the ductless glands. The most notable of these changes occur in the hypophysis,

---

(9) Jour. Exper. Med., 1915, Vol. 22, p. 25.

as has been previously observed in marmots by an Italian investigator, Gamelli. The gland not only diminishes in size but the cells of the pars anterior, in some animals at least, completely lose their characteristic staining reactions to acid and basic dyes. At the end of the dormant period the gland swells, and as the cells enlarge they again acquire their differential affinity for acid, basic and neutral stains, and at the same time karyokinetic figures may appear.

"On the basis of these observations hibernation may be ascribed to a seasonal physiologic wave of pluriglandular inactivity. The essential rôle may perhaps be ascribed to the pituitary body, not only for the reason that the most striking histological changes appear in this structure but also because deprivation of the secretion of this gland alone of the entire ductless gland series produces a group of symptoms comparable to those of hibernation."

The striking difference in the histologic appearance of the hypophysis during and after hibernation is seen in plate IX.

DISEASES OF THE SPINAL CORD.

TRAUMATIC AFFECTIONS.

Spinal Cord Injuries in the War. H. Oppenheim[1] states that cord injuries are relatively frequent. It is exceptional to find pieces of projectiles in the spinal canal. More often they are found in the vicinity of the spine or they have glanced off. On *x*-ray examination of the spine, fracture may be found or no bony changes whatever. In the latter case one may assume that the bullet has rebounded but that the impact sufficed to produce changes in the cord, among which the author found meningeal hemorrhage, meningitis serosa or serofibrosa, haematomyelia and acute traumatic softening. Two chief clinical types of these cord lesions are seen, those with symptoms of total transverse lesion and those of the Brown-Sequard or unilateral type. Fortunately

---

(1) Berl. klin. Wochenschr., Nov. 30, 1914, Vol. 51, p. 1853.

the latter type preponderates. Oppenheim has learned that one must be very slow in making a diagnosis of total severing of the cord as none of the accepted signs of this lesion is trustworthy.

In most cases of gunshot wounds of the cord, pains of radicular, spinal and meningeal origin of great severity are present. ''Bladder cramps'' of fearful intensity occur. One patient was thrown to the ground by the air pressure from a passing shell and acquired a hemorrhage into the cervical region of the cord. He saw only a few cases of lesions of the cauda equina and these presented no unusual features.

The treatment of these cases was most difficult, especially the decision as to whether to operate, and if so, when. The author is not yet settled in his mind on this question. Demonstration by the *x*-ray of a bullet or fragment of bone in the spinal canal is a clear indication for operation. The presence of a total transverse lesion is no contraindication unless it already has existed several months. Fracture of the arches of the vertebrae and lesions of the cauda equina are relatively hopeful cases for the surgeon.

Kurt Goldstein [2] also discusses the operative treatment of gunshot wounds of the cord. He does not accept Bastien's doctrine, affirmed by Dejerine, Bruns and others, that loss of tendon reflexes and flaccid paralysis indicate total transverse lesion. Thus in one case operation revealed a bullet outside the dura wedged in the bone and compressing the cord like an extra-dural tumor. In other cases splinters of bone or projectiles were found outside the dura and the cord itself appeared perfectly normal. In a case examined post mortem the dura was externally intact but adherent to the cord, and the latter was compressed by fibrous bands. In all of these cases the so-called typical clinical picture of transverse lesion was present and there certainly was no gross transverse lesion in any of them. But the author adds that microscopic examination has not yet been made. In one of the cases mentioned, that of a bullet in the spinal canal, the reflexes returned, together with a certain amount of

---

(2) Neurol. Centralbl., Feb. 15, 1915, Vol. 34, p. 114.

motor power. The author therefore favors exploratory operation except in cases where the bone destruction is so extensive that total severing of the cord must be assumed.

L. J. Muskens,[3] a distinguished neurologist of Amsterdam, expresses similar views and reports two cases in detail in which, according to the classical theory, total transverse lesion could be postulated, but its existence was disproved by operation. He maintains that no neurologic symptom complex exists which justifies a diagnosis of total transverse lesion and that while it is true that all deep and superficial reflexes except the plantar ones are lost in total lesions, the reverse is not true, namely, that such loss necessitates the assumption of the existence of a transverse lesion.

On the other hand M. Lewandowsky[4] maintains that in wounds of the spine operation is nearly always contraindicated, being useless in case of total transverse lesions and a detriment in the partial ones, which frequently do better without operation. Those injuries of the cord which give hope of improvement are almost never produced by laceration but by traumatic necrosis and hemorrhage. The most important indication in cord injuries is the prevention of infection of the urinary bladder.

A Plea for Laminectomy in Apparently Hopeless Wounds of the Cord is made by Otto Marburg[5] on the basis of 35 cases of severe bullet wounds of the cord observed by him in Eiselsberg's clinic in Vienna. He also emphasizes the impossibility of determining without operation whether a total transverse lesion exists or not. He lays down the rule that when there is no improvement after four or five weeks, laminectomy should be performed, in the absence of contraindications. The latter consist of pulmonary and abdominal complications, severe suppuration near the field of operation, purulent cystitis and ascending pyelitis. Operation is not contraindicated in case of light infections of the urinary tract and granulating bedsores. Like other observers he finds

---

(3) Neurol. Centralbl., Jan. 2, 1915, Vol. 34, p. 7.
(4) Ibid., p. 47.
(5) Neurol. Centralbl., Mar. 16, 1915, Vol. 34, p. 184.

that a transverse total cord lesion is only exceptionally directly caused by the projectile but by indirect lesions, particularly edema and softening. He reports the following case which offers a striking argument for the correctness of his standpoint: A Russian soldier was shot through the neck at Lemberg in September, 1914, and came to the clinic a week later. There was impaired sensation below the level of the seventh cervical segment and total loss of all sensation below the fourth thoracic segment. The paralysis of the four extremities was total and flaccid with loss of all tendon and cutaneous reflexes and retention of urine and feces. Although the symptoms would indicate a total transverse lesion, laminectomy was performed a month later and the condition met with was an arachnoid cyst, or circumscribed serous meningitis, extending from the seventh cervical to the second thoracic segments. Soon after operation sensation began to return; the reflexes returned and became exaggerated. Motor power returned, and at the time of the report the patient could already walk with support. The author justly insists that one such case is a strong argument for exploratory operation, and he is amazed at the objections raised in certain quarters when we consider the relatively small risk of laminectomy when a skillful surgeon is available.

The Condition of the Reflexes in Complete Section of the Cord. Above we have quoted Oppenheim's statement that his war experience has taught him that none of the generally accepted signs of total transverse lesion of the spinal cord can be considered trustworthy. As abolition of all tendon reflexes below the level of the lesion is among these signs, it is interesting to record the experience of Dejerine and Mouzon,[6] who observed 6 cases with symptoms of transverse lesion in wounded soldiers, two with autopsy, and a case of carcinoma of the spine, also with autopsy. The cases are reported in detail and the state of the reflexes was recorded from day to day. In their summary the authors emphasize the following points:

1. The absence of all tendon reflexes in the 6 cases

---

(6) Rev. Neurol., March, 1915, p. 155.

of sudden traumatic section, according to Bastian's law; the persistence for four days of a weak knee jerk in a case of total transverse lesion produced suddenly by thrombosis and softening in a cord which had been compressed for a long time by carcinoma of the spine, the reflex being stronger on the side which had been most compressed.

2. The persistence of cutaneous reflexes, plantar, cremasteric, anal and abdominal in all of the cases (after temporary absence during the first few days), which supports the view of those who believe these reflexes to be purely spinal.

3. The plantar reflex in most of the cases was of the normal flexor type. The authors add that in 7 cases of incomplete section of the cord the plantar reflex was constantly of the extensor type (Babinski sign).

4. The constant presence of defense reflexes shown by visible contractions of the tensor of the fascia lata, the adductors and the sartorius.

5. The coexistence of this defense reflex with either flexor or extensor response of the big toe.

6. The possible irradiation of this reflex to the opposite side.

7. The presence of fixed abnormal position of the toes which can be explained only as a form of contracture.

8. The presence of spontaneous muscular spasm resembling the defense reflex movements.

9. The inconstancy of some of the signs noted, perhaps dependent in part on the initial shock and the destruction by softening of cord tissue, due to lesion of spinal arteries above the level of the original injury.

10. The great variety of reactions observed, similar stimulations resulting in different responses at different times.

11. The instability of the reactions, especially of the movements of the toes produced by plantar irritation. This may in part depend on changes in the peripheral nerves and muscles, or on vascular disturbance.

H. Claude and A. Petit[7] reported three cases of complete transverse lesion of the cord from bullet wounds,

---

(7) Rev. Neurol., March, 1915, p. 217.

all fatal, with loss of both deep and superficial reflexes. One lived five days, one seventeen days, and one five weeks after the injury. In the discussion Dejerine remarked that as the last two had been wounded in the lumbar region, the loss of cutaneous reflexes was not significant [presumably because it might be due to injury to the cauda equina.—Ed.] And as the one with a wound in the cervical region had lived only five days, the observation is not contradictory to his own, as he often found the superficial reflexes absent for a number of days after the injury.

Spinal Decompression.

Spinal Decompression in Meningomyelitis. From year to year we have pointed out in these columns the rapid advances in the surgical treatment of chronic diseases of the spinal cord and its coverings associated with paralysis, pain and other sensory disturbances. This year Alfred S. Taylor and J. W. Stephenson[8] report four cases of meningomyelitis in which laminectomy was performed. The cases, the operative findings and the principles of operative treatment were nearly identical with those reported by Krause, of whose cases the present writers had no knowledge until after their last case had been operated. After relating the histories in detail the authors discuss the cases as follows:

These cases have many features in common and are almost counterparts of the case reported by Krause. In three cases there was a history of exposure, twice to inclement weather and once to street car injury. In each instance the onset was in the form of severe neuralgic root pains referred to a fairly definite cord level. After these pains, which underwent remissions and exacerbations, had lasted for a variable length of time, there came a more severe attack of pain which was soon followed by motor disturbances, loss of sphincteric control and the other phenomena indicative of a transverse lesion of the cord. In the fourth case there were no motor nor sphincteric disabilities, so that in this case the diagnosis will

---

(8) Jour. Nerv. and Ment. Dis., 1915, Vol. 42, p. 1.

be questioned, but in every particular other than these it fits so well into the series that it seemed worth while to include it.

In each case the upper level of the lesion was pretty clearly indicated.

In two of the four there were trophic disturbances, one a bedsore over the end of the spine, the other a disturbance over the outer side of the heel and foot.

In the two cases in which a temperature record has been preserved one ran up to 102° F., and the other to 103° F. during the attack.

The interval between the onset of definite symptoms and operative relief was in Case 1, thirteen months; Case 2, three months; Case 3, seven months; while Case 4 had had seven months of disabling pain, although his street car trauma which had occurred three years before had been followed by more or less continual discomfort.

In each case the cord was exposed by a unilateral laminectomy. In none of these cases was there any evidence of bone disease. The cord was very much congested and was obviously swollen but not sufficiently to fill out the dural canal. In Case 2 the swelling was more evident in the right half of the cord, though there was no circumscribed tumefaction. An incision was made in the posterior column of the right side. In Case 4, the symptoms were unilateral, the cord was equally congested on both sides.

In Case 3, in addition to the congenital narrowing of the bony canal, which greatly aggravated the pressure effects, there was distinct inflammatory swelling of the dura as well as of the cord. The effect of these combined factors was to eliminate the flow of spinal fluid past this portion of the cord and to cause a cessation of circulatory pulsation in the cord. Following decompression with wide opening of the dura and longitudinal incision of the posterior column of the cord there was very soon a relief of tension as indicated by the return of pulsation in the cord.

With the clinical histories and operative findings the diagnosis of meningomyelitis is established in apparently all the series with the possible exception of the fourth, which was somewhat atypical.

In none of the series was there any postoperative shock, or an exacerbation of the symptoms even of a temporary nature.

In Case 1 operation had no effect whatever and there was a steady progression of the symptoms until death occurred on the 24th day after operation. Unfortunately no autopsy was permitted.

In the remainder of the series the improvement was prompt and remarkable when it is considered that there had been progressive disability over a period of months preceding the operation. Within four to eleven days the pains and objective sensory disturbances had largely disappeared, the sphincteric control had returned shortly after that, and motor power had reappeared in eight days in Case 3, although the patient had been bedridden and unable to move his legs for months. In sixteen days he was walking the length of the ward.

The last two of the series are still under observation. They have suffered no setbacks since operation, have no pains and no motor disturbances, and may fairly be considered cured.

The second case remained under observation only about five weeks, but during that time sphincteric control had returned, the sensory symptoms had nearly disappeared, and the return of voluntary power in the muscles of the lower extremities was well advanced, so that he also should be classed as a successful result. Rumor says that he died several months later, but nothing can be learned definitely as to the fact or the cause of death.

''Statements as to the way in which decompression acts must of course be speculative. To us the most rational explanation lies in an improvement in the local circulation with the resulting more rapid absorption of the inflammatory infiltration and the return of function in the damaged areas of the cord. This is especially corroborated by the findings and results in the third case. Here the combination of congenital narrowing of the bony canal, with marked inflammatory thickening of the dura and swelling of the cord substance had caused pulsation to cease. Decompression, free splitting of the dura, and incision of the posterior column of the cord caused, within very few minutes, the return of full pulsation in the cord substance. Cord function returned in a surprisingly short interval.

"Just what value lies in the incision of the posterior columns of the cord remains to be proven by further investigation, but it would seem to improve the drainage of the inflammatory exudate away from the cord into the spinal fluid and so hasten the return of the cord to normal.

"The experimental work on the traumatized cords of dogs, reported before this association by Allen of Philadelphia, in which free incision of the posterior columns greatly lessened the amount of permanent damage from a given degree of injury to the cord, strongly argues for the addition of this detail of technic to the bony decompression and free division of the dura.

"Properly executed, incision into the posterior columns of the cord, in the living human subject, has repeatedly been shown to be innocuous by Elsberg and others as well as myself."

CONCLUSIONS.

1. Selected cases of meningomyelitis are susceptible to surgical treatment, where the findings indicate the segmental level.
2. This treatment should consist in laminectomy, free opening of the dura, and, probably, incision into the posterior columns of the cord, especially in those cases showing marked infiltration and swelling of the cord.
3. This operation, properly performed, adds very little to the jeopardy of the patient, but, on the contrary, seems greatly to diminish the period of convalescence and to lead to a more nearly normal return of function in the cord than is usual in these cases when treated expectantly. Many surgeons have demonstrated that laminectomy is not a very dangerous operation.
4. Decompression probably acts favorably by causing

freer circulation, with the more rapid absorption of the inflammatory exudate. Incision of the cord probably facilitates drainage.

5. The small risk inherent in laminectomy, and the great advantage likely to accrue to the patient, argue much in favor of the surgical treatment of these cases. The same facts also argue for the earlier employment of exploratory laminectomy in most spinal cases where the diagnosis is not perfectly clear, but where the symptoms point to some cord level as the seat of trouble.

Toxic Affections.

The Cord Changes in Pernicious Anemia. Dejerine and Mouzon[9] presented to the Paris Neurological Society a woman 49 years old with severe pernicious anemia, the red count being only 900,000 per cubic millimeter. On the neurologic side she presented an unusual combination of symptoms, namely, ataxia and nearly complete loss of all deep sensibility. On the other hand there was no loss of superficial sensation, no pain, no paralysis, no change in the deep reflexes, no Babinski sign, no cerebellar asynergy. It is considered safe to assume that there was a degeneration in the posterior columns limited to the long ascending fibres without involvement of the posterior roots themselves. The authors know of only four previously reported cases of loss of deep sensibility with the superficial preserved.

Pernicious Anemia Showing Family Tendency and Mental Symptoms. Arthur W. Rogers[1] quotes Cabot as having found records of "mental disturbances in 102 out of 647 cases of pernicious anemia; delirium in 44 cases; definite delusions in 14; hallucinations in 8; dementia in 9; true melancholia in 3 and mania in 3. One case remained in a public asylum for 29 years. In three markedly insane cases, the mental symptoms preceded the manifestations of anemia by several months. Presumably these mental symptoms are to be explained as a part of the general autointoxication rather than a

---

(9) Rev. Neurol., May-June, 1915, p. 382.
(1) Wisconsin Med. Jour., October, 1915.

result of the minute hemorrhages found in the brain post mortem."

Rogers gives further data regarding a remarkable case previously published by Arthur J. Patek[2] under the title, "Family Pernicious Anemia." The father, two paternal uncles, two brothers, a sister and a paternal cousin all had died of pernicious anemia. The patient, a woman 36 years old, when first seen in August, 1908, had been depressed, confused and exhibited delusions of unworthiness for several weeks. She was well nourished but looked anemic. A blood examination at this time showed a red count of 3,700,000, no nucleated red cells and but little poikilocytosis, hemoglobin 45 per cent. Within a month she became practically well and remained so until May, 1911, when she developed another attack similar to the first one, but more profound in mental and physical symptoms. At this time the knee jerks were greatly exaggerated, ankle clonus was present and the arms and legs were very rigid. The red cells dropped to 2,330,000, with hemoglobin 50 per cent. Improvement set in during the succeeding two months, with apparent recovery of the mental symptoms but with partial retention of the spastic condition. A third attack of depression occurred in June, 1912, with restoration to a normal mental state after three months, during which the red count rose from 2,800,000 to 4,480,000 and the hemoglobin from 50 to 75 per cent. The physical symptoms cleared up with the exception that the knee jerks remained decidedly exaggerated. In January, 1913, she began to experience unusual exhaustion and shortness of breath. Only a slight degree of depression and confusion was present and there were no spinal symptoms aside from the increased reflexes. In the autumn of the same year she again was apparently well, but in the early part of 1914 prostration became extreme and mental confusion was marked. She died from exhaustion in April, 1914. Necropsy was not obtained.

Rogers reports another case, that of a woman 46 years old who came under observation in 1911 on account of weakness in the legs which apparently was merely the

---

(2) Jour. Amer. Med. Ass'n., May 6, 1911.

result of general fatigue resulting from strain and worry accompanying the final prolonged illness of her mother. A distinct spastic paraplegia with increased reflexes was present but sensation was normal. The reflexes of the eye and the eye grounds were normal and there was no disturbance of the cranial nerves. There was pronounced insomnia and the patient was highly nervous, irritable and emotional. The mental picture was one of great weakness and confusion and suggested a gradually increasing dementia. Her condition gradually grew worse in every respect until she was finally confined to her bed and developed incontinence of both urine and feces. At noon on January 25th, she had an epileptoid seizure, was unconscious for over an hour and was resuscitated with great difficulty. Following this attack there was no apparent increase in the paresis. In short, no new symptoms grew out of this seizure aside from increased mental dulness. The following day it was observed for the first time that the skin and mucous membranes presented a slight lemon color. This suggested an examination of the blood which resulted in the following findings: 2,800,000 red cells, 20,000 white cells, hemoglobin 45 per cent., a few gigantoblasts, a few microcytes, slight poikilocytosis, but no nucleated reds. In a few days marked dyspnea developed, the pulse became rapid and she showed an evening temperature of 100°. The face and hands became very yellow, delirium set in and, gradually failing, she died February 11, 1911.

Cord Lesion from Poisoning with Benzine. G. Dorner,[3] assistant in Strümpell's clinic in Leipzig, reports the case of a man 35 years old admitted to the hospital in March, 1914, who had been overcome by benzine fumes in May, 1912. He was in a tank, became dizzy and fell over with the right half of his body in the benzine. After 20 minutes he was discovered and carried out totally unconscious. He remained nearly unconscious for 3 days. He improved gradually and could walk after 2 weeks, but tired easily and had frequent attacks of dizziness with dyspnea and perspiration. He did light work for 7 months but had to give it up on

---

(3) Deutsche Zeitschr. f. Nervenh., 1915, Vol. 54, p. 66.

account of increasing pain and weakness in the legs. His writing became tremulous; so he gave up work in January, 1913. When admitted to the hospital he complained chiefly of weakness in the legs, dizziness, numbness of the right hand and lumbar pains.

Examination: A well nourished man with dull and slightly stiff facial expression. The hands, especially the right one, were bluish and cold. Slight tremor of the eyelids and very slight intention tremor. Both pupils react well, but the left one is smaller than the right. Slight nystagmus on looking to the right. Diminished temperature sense in both legs, which also show slightly diminished tactile sense. Pain sense diminished on the feet and on the second and third fingers of the left hand. Muscular development good but the strength in the right leg is poor, and not good in the left leg considering the appearance of the muscles. Some ataxia in the right arm and leg. Romberg sign present and the gait unsteady and stamping. Right knee jerk absent, left increased. Babinski sign present on both sides. Abdominal and cremaster reflexes absent. Wassermann test negative with both blood and spinal fluid. The latter showed no increase in globulin or cells. The blood and urine showed nothing abnormal. When re-examined over a year later, in June, 1915, the right side was a little stronger and the right knee jerk could be obtained but walking was still difficult and scarcely possible without a cane.

The clinical picture bears the greatest resemblance to multiple sclerosis or to a combined degeneration of the cord. The absence of cerebral symptoms makes the diagnosis of combined degeneration of the cord the more likely one, especially as the picture resembles that seen in the combined degeneration of the cord in connection with severe anemia and pellagra and occasionally after carbon monoxide poisoning.

In reviewing the literature the author states that necropsies after acute benzine poisoning have revealed hemorrhages in all organs, including the brain, and cherry-red blood as in carbon monoxide poisoning. Dorendorff described two cases of chronic poisoning in rubber workers who suffered from headache, impaired memory, speech disturbance, heavy and cold feeling in the extremities. The knee jerks were increased, tremor, nystagmus and fibrillary twitchings of the tongue were present. Oliver describes blindness, impaired memory and multiple neuritis, and Gowers myasthenic symptoms following benzine poisoning.

SYRINGOMYELIA.

The Pathology of Syringomyelia is discussed by M. S. Margulis,[4] who had opportunity to examine 7 cases post mortem. In The Practical Medicine Series, 1913, Vol. 10, p. 71, we reviewed a study, by the same author, of the pathology of primary chronic hydrocephalus. It is only natural that this author should have followed that study by one of syringomyelia, as part of his conclusions were as follows:

"The coincidence of syringomyelia and chronic primary internal hydrocephalus is frequently observed."

"The histologic picture of primary hydrocephalus is in all essentials analogous to that of the spinal gliosis seen in syringomyelia."

"Primary hydrocephalus and syringomyelia only represent different localizations of the same process, viz: congenital gliomatosis."

Of his 7 cases of syringomyelia, 3 were combined with hydrocephalus and in 1 case the cord condition was an accidental post mortem finding in the body of a patient who had died of traumatic tetanus.

The most constant histologic finding of syringomyelia is the cavity which most frequently is found in the region of the central canal, in the grey matter between the commissures, in the region of the posterior horns and in the anterior part of the posterior columns. Clefts sometimes extend from the cavity to all parts of the grey matter of the cord. The shape of the cavity varies at different levels, as may its location. It may lie asymmetrically on one side of the cord, and sometimes several cavities may be seen in one cross section. The clinical

---

(4) Deutsche Zeitschr. f. Nervenh., 1914, Vol. 53, p. 18.

course of the disease as well as the analysis of the anatomic changes show that we are dealing with a progressive process, and we therefore expect differences in the cavities according to the age of the process. We must therefore begin our study with the simplest type of cavity by considering the findings in very early cases and by studying serial sections of older cases. In the latter we can trace the transitions from simple dilatations of the central canal to cavities of various shapes having no resemblance whatever to the central canal. The author confirms the view of Preobrashensky that the simplest form of cavity is a dilated and altered central canal. The histologic picture of the cavities is further complicated by the presence of diverticula of the central canal, which in turn become dilated and otherwise altered. The cavities are lined by ependymal epithelium in one or several layers surrounded by more or less proliferated glia tissue.

The various theories of the pathogenesis of syringomyelia may be divided into two classes. First, those ascribing the principal rôle to extrinsic factors, *i. e.*, the disease is considered an acquired one. Second, those ascribing the disease to developmental disorders. The author finds that the theories of the first group are untenable and based on superficial resemblances. Thus the theory that the cavities may be secondary to hemorrhages is largely based on the occurrence of dissociation of sensation and muscular atrophy in both conditions. The author rejects the theory advanced by Westphal and others that syringomyelia is due to glioma in which degeneration occurs with secondary formation of cavities, and agrees with Weigert who, in 1905, declared this theory a "fable." The study of serial sections confirms Preobrashensky's statement: "In no single case could we find glia proliferation not connected with the central canal; all glia proliferation originates in this location." The correctness of the developmental theory is further confirmed by the frequent anomalies of the cord in cases of syringomyelia, usually of the nature of irregularities of the closure of the medullary canal such as diverticula, dilatation of the central canal, heterotopia of grey substance, etc. Association with other developmental disorders, such as spina bifida and hydrocephalus, also are of importance. Cases of inherited syringomyelia have been described, and the disease has been demonstrated in the new-born. Margulis considers it possible that a chronic inflammatory process in fetal life, possibly involving the ependyma itself, may give rise to the cavity formation.

Remissions in Syringomyelia. Most physicians think of syringomyelia as a rare disease which only neurologists need to know about. A similar view is commonly held regarding multiple sclerosis but practically never in connection with tabes dorsalis. It is therefore well to reiterate the statement, based on careful statistics from clinics in small university cities which draw their material chiefly from the rural population, that both of these so-called rare diseases actually exceed tabes in frequency. At least this has been the experience in Germany and was emphasized by Hans Curschmann ten years ago. This year Eugen Stähle,[5] assistant in the medical clinic at Tübingen, in the introduction to his paper on remissions in syringomyelia states that in six months' service in the out patient department of this comparatively small clinic he saw not less than 27 cases of this disease. He says he wishes not only to confirm but to underscore the statement by Curschmann, just mentioned. With such abundant material it is natural that special attention is given to the atypical cases with a view to perfecting early diagnosis.

Stähle reports in detail a remarkable case in which there occurred a complete remission of all symptoms, lasting 7 years. As the case has been under observation at the clinic for nearly 20 years the report is extremely instructive. The patient is a farmer born in 1864. In 1881 he lost the left thumb by an accidental gunshot wound. In 1894 he had 3 months of frequent frontal headache and in January, 1896, sharp pains occurred in the right calf and later in the left calf. Both feet became very weak and after 6 weeks the left arm became weak. He then was admitted to the clinic. His gait was very unsteady and stamping and he swayed much when

---

(5) Deutsche Zeitschr. f. Nervenh., 1915, Vol. 53, p. 404.

standing with the eyes open and more with the eyes closed. The knee and ankle jerks were absent. Touch, pain and temperature sense were not disturbed and there was no sphincter disturbance. The pupils were normal and there was no history or evidence of syphilis. On account of the history of sharp pain at the onset, the absence of reflexes and the presence of ataxia a diagnosis of tabes was made. He improved rapidly and a month later the knee jerks had returned and he was able to work. A year later he was practically well and in 1900 he remained well so it was thought the case might have been one of chronic meningitis rather than tabes. In 1903 he returned on account of pain in the head and left arm which had been present for three years. Examination again showed normal pupils but there was a rotary nystagmus on looking to either side. The muscles of the thenar and hypothenar eminences of the right hand showed some atrophy. Considerable ataxia of the legs was present. Tactile sense was normal but pain and temperature sense were lost in large areas on both arms and legs. The tendon reflexes were absent. This time a diagnosis of syringomyelia was made. After a couple of months he rapidly improved and by the end of the year (1903) he was well again. He stayed away for ten years, returning in June, 1913, on account of pain in the heart region, cough and poor sleep. Left sided pleurisy was detected. Pupils were still normal, the left knee jerk was present, the right one absent, ankle jerks absent, marked loss of temperature sense on the left side of the face, in both arms and in both legs. Pain sense was also lost on the left side of the face. The previously observed muscular atrophy had disappeared but in February, 1914, a slight atrophy was noticed in the left hand. The Wassermann test with the blood was negative.

On searching the literature the author found that Oppenheim in 1896 called attention to the great similarity to tabes in cases of syringomyelia in which the posterior columns are involved. Sudden aggravation of the symptoms as well as partial remissions have been described by Schlesinger and others. In a recent edition of his text-book Oppenheim states: "Remissions sometimes occur. This was particularly striking in a case described by Müller and Meder in which the paralysis of all four extremities almost disappeared. Similar disappearance of the sensory disturbance has been observed by Beevor. The occasional sudden paralysis occurring in the course of the disease may depend on hemorrhages in the cord, as was demonstrated in one case by Bruce and which Gowers has designated syringal hemorrhage; edema and serous effusion into the cavities may also cause sudden paralysis.'' Remissions of paralysis are more frequent than of sensory disturbance and restitution of atrophic muscles has only been described once, namely, by Schlesinger. Stähle observed disappearance of sensory disturbance in areas in three of his 27 cases.

Multiple Sclerosis.

The Visual Disturbances in the Early Stages of Multiple Sclerosis. The following statements in a paper by Foster Kennedy[6] throw some light on the frequent, often very complicated and irregular eye symptoms of this disease.

''The hypothesis of an interstitial inflammation set alight by a toxin emanating from the blood or lymph-stream and giving rise to local edema exerting mechanical pressure on the contiguous nerve-fibres, is required if we would properly interpret the phenomena of the disease and intelligently explain in particular those more acute types of which this paper particularly treats.

''In two of my cases edemas especially affected the medulla, giving rise to a series of paralyses of cranial nerve nuclei, a picture rather resembling a basal meningitic condition. In two there was acute inflammation of the optic papillae; in the third were seen unequivocal signs of an antecedent retrobulbar neuritis, ocular phenomena sufficiently important to merit here some detailed discussion as to their significance.

''The most frequent prodromal symptom of an incipient sclerotic change throughout the central nervous system is some transient disturbance of the function of

---

(6) Jour. Am. Med. Ass'n., Dec. 5, 1914, Vol. 63, p. 2001.

vision. Broadly speaking, this may be of two kinds: first, a passing attack of diplopia due to a sudden edematous change usually in the neighborhood of the oculomotor nuclei; second, a mistiness or blurring of vision rarely bilateral and of a duration varying from a matter of seconds to, in infrequent instances, some thirty-six or forty-eight hours.

"The optic nerve, being in direct continuity with the central nervous system, is vulnerable in proportion to the delicacy of its physiologic functions and anatomic structure, by the morbid states affecting both the central and peripheral nervous systems. Not only is it vulnerable in proportion to its delicacy, but the same statement applies to its constituent parts, for we find that failure of visual acuity first takes place in those parts of the fields subserved by the most highly specialized groups of fibres in the trunk—the macular bundles—with the result that visual failure, in almost all cases of retrobulbar neuritis, takes the form of a central or paracentral scotoma. When such a gap occurs in the field of vision, it is present at first only as a localized disturbance of the color sense, which however quickly becomes a loss of perception of form as well.

"It is during the formation of such scotomata that the patient complains that objects are seen as through a mist or film, and that, when reading, the letters often seem at times to run together—symptoms doubtless explained by unequal functionating power in contiguous optic nerve-fibres resulting in unequal and confused perceptions. That insular sclerosis has a toxic origin is a hypothesis already put forward in this paper, and the likelihood of its truth is enhanced when we correlate the reactions of the optic nerve to poisons like wood alcohol and excessive tobacco with those found in the same structures in the course of disseminated sclerosis. It has been said above that fleeting attacks of intensely acute diplopia also constitute one of the earliest manifestations of the onset of this disease. Dependent on such diplopias frequently occur acute vertiginous seizures. Diplopia is the result of a sudden loss of parallelism in the axes of the eyeballs, the result of rapid weakening of one or more ocular muscles, with consequent overaction of the intact antagonists."

ACUTE ANTERIOR POLIOMYELITIS.

The Microbic Cause and Manner of Infection. Simon Flexner[7] brings forward additional evidence in favor of the etiologic relationship to this disease of the organism described by himself and Noguchi [see Practical Med. Series, 1913, Vol. 10, p. 108, for full description of the organism and its cultivation in ascitic fluid containing a fragment of kidney tissue]. It will be recalled that the organism was cultivated from the central nervous organs of both human beings and monkeys and that successful inoculations had been made with cultures of even the 20th generation.

"It was, however, found that of the different cultures of the microörganism obtained only a few were capable of causing experimental poliomyelitis upon inoculation, the greater number of cultures proving inactive or non-pathogenic. It was, moreover, quickly ascertained that the possession of pathogenic properties did not depend upon the generation inoculated; or, in other words, that an inactive culture proved non-pathogenic in the second as well as in later generations. This observation itself seemed to exclude some admixed indefinite 'virus' as being the cause of the experimental infection when active cultures were inoculated and to connect the pathogenic effect with particular strains of the cultivated microörganism under consideration.

"There is nothing exceptional in this observation. All the data possessed indicate that the virus or microbe of poliomyelitis is highly parasitic; that is, resides and multiplies only within animals subject to its pathogenic action and not elsewhere upon living or dead things indifferent to its effects. When, therefore, such highly parasitized microörganisms are cultivated artificially they not infrequently quickly lose, wholly or in part, their pathogenic action.

"Another possibility exists which may account for the

---

(7) Bull. Johns Hopkins Hosp., May, 1915, p. 180.

lack of disease-producing power in certain strains of the cultures. The monkey is not, of course, a natural subject for poliomyelitis and is, on the whole, resistant to infection. On that account not all specimens of nervous tissues derived from human subjects of infantile paralysis can be implanted on the monkey; a percentage of strains of virus only of human origin are pathogenic for that animal. If, therefore, the cultivated virus or microörganism of poliomyelitis merely displays the original power of infection possessed by the human specimens a part only would be effective when inoculated into monkeys.''

In a new series of experiments, cultures were put aside for a whole year, at the end of which time the microörganism was still living. Subcultures were made into monkeys with the result that infection was not produced after a single inoculation but after repeated ones. The fluid containing the microörganism was injected into the peritoneal cavity or the spinal membranes once every 6 to 9 days, the monkeys developing paralysis and succumbing after the fourth or fifth injection. The symptoms which arose ressembled those of poliomyelitis and the lesions present in the nervous system were characteristic. Flexner takes up the question of the mode of transmission and begins by recalling the experiments of Rosenau and of Anderson and Frost, who have succeeded in communicating the disease to healthy monkeys bitten by stable flies who previously had been allowed to feed on infected monkeys. [These experiments were discussed in the Practical Medicine Series, 1912, Vol. 10, p. 114.]

''On the other hand, later experiments conducted by Rosenau and by Anderson and Frost, as well as by other investigators in this country and abroad with the stable fly, have failed completely to confirm the earlier successful tests.

''Considerable light is thrown upon this question by experiments conducted with the blood which is removed by syringe from cases of acute poliomyelitis and injected into the veins of monkeys. Although many such experiments have been made, no one has ever detected the virus in the blood of human subjects of the disease. On the other hand, we succeeded in two instances in detecting the virus in the blood of monkeys, but only during a brief period in the course of the infection, a result confirmed by the finding of the minute microörganism in the blood by microscopical examination in one instance by Amoss. The conclusion therefore appears to be that under certain conditions the stable fly may perform the part of the syringe in withdrawing virus containing blood from the monkey and reinoculating it into other but healthy monkeys which in time may develop the symptoms and lesions of poliomyelitis. More than this, the few positive tests do not show; while the many negative ones indicate that the conditions mentioned are highly exceptional even for the monkey and, thus far, incapable of offering an explanation of the mode of infection of poliomyelitis in man.

"On the other hand, the virus of the disease has been ascertained both to enter and to leave the infected subject by way of the naso-pharyngeal mucous membrane. It has been detected in that situation not only in frank cases of infantile paralysis in man, but also in slight ones, abortive, so-called, and even in healthy persons who have been in intimate contact with active cases. Moreover, a few instances are known in which, after recovery, the virus was still detectable in the secretions of the nasopharynx for several months. In other words, we have to do in infantile paralysis, as in so many other acute infections, with a series of factors which afford potentially ready means for the dissemination far and near of the microbic agent of infection. In this distribution the abortive cases, many of which are very little ill, doubtless constitute the greatest menace, although the passive and chronic carriers of the microbes, as the healthy or recovered but contaminated persons are called, who still continue to discharge infectious secretions from the throat and nose, play each an important and sinister part in this process. In this manner there can be explained, on the whole satisfactorily, the bizarre and puzzling appearance of cases of poliomyelitis, separated often by blocks or miles, between which no obvious intermediaries can be detected to connect one with the other. But connected they have been in notable instances by the tracing of the go-betweens which have been ascertained to be of the kind just described, namely, abortive examples of the disease and carriers of the infectious agent.

"The peculiarity of distribution just outlined is further illuminated by the fact that the human subject evidently possesses a high degree of resistance to infection with the microbic cause of poliomyelitis. This circumstance explains the sporadic appearance of cases, now here, now there, while many otherwise apparently susceptible persons entirely escape infection, or, responding, do so with such slight symptoms of illness as often to elude detection unless special attention be paid to their discovery.

"These, then, are in brief the reasons why I believe the microbe of poliomyelitis to be borne by persons and not by insects. What the sanitary implications of the data set forth are is obvious, and since there exists no specific mode of treatment for infantile paralysis, and in view of the fatalities and the severe crippling which it causes, every effort should be put forth which promises limitation of the spread of the malady."

SPINAL CORD TUMOR.

The Sensory Symptoms of Spinal Cord Tumor. Charles A. Elsberg[8] comments on the scant attention given to the neural origin of many cases of persistent abdominal pain. Even the well known gastric crises of tabes are often not recognized and the patients are subjected to useless operations on the stomach. During the past five years two patients were sent to the surgical service of the author with the diagnosis of acute appendicitis; in both instances the patients had Potts' disease with irritation of spinal nerve roots and areas of skin and muscle tenderness in the right iliac region. He has personal records of three patients on whom various operations had been performed, a floating kidney anchored, the appendix removed, the gall bladder operated

---

(8) Am. Jour. Med. Sci., Mar., 1915, Vol. 149, p. 337.

on, in one case a hysterectomy performed for pain and tenderness in the lumbar, right iliac and right hypochondriac regions; finally they were found to have a spinal tumor or a neuritis of the nerves of the cauda equina. In Elsberg's last one hundred laminectomies for spinal disease, six were in patients who had been treated for long periods for abdominal symptoms. In four of these patients intraspinal tumors were removed. He urges that in every case of indefinite abdominal pain and tenderness it is advisable to make certain that we are not dealing with a cutaneous hypersensitiveness which so often simulates real abdominal tenderness. As an example, the case of a woman 43 years old is related. For two years she had suffered from frequent attacks of pain in the lower abdomen on the left side. She had been cystoscoped, had the ureters catheterized and been operated for cystocele and rectocele, all without relief. Careful examination revealed the fact that the abdominal pain and tenderness were really due to a superficial skin tenderness and that this was limited to the distribution of the twelfth posterior thoracic root on the left side. The patient had a slightly exaggerated knee jerk on the left side with a slight tendency to ankle clonus. On the right side there were diminished sensation over three toes and diminished deep muscle sense in the big toe. The diagnosis of a small tumor pressing upon the twelfth dorsal root was made. Laminectomy was performed, an almond-sized fibroma removed and the patient recovered. As is often the case, some pain remained for almost a year, probably due to changes in the nerve from prolonged compression. Elsberg therefore now finds it advisable to divide the root involved.

Elsberg pays a tribute to Spiller and Martin of Philadelphia who devised the operation of dividing the anterolateral tracts of the cord for the relief of very severe pain of neural or spinal origin such as that of metastatic carcinoma of the spine. In such cases even extensive root resection often fails. He believes that the future for this operation is a bright one and that the partial failures reported resulted because the tracts were not divided sufficiently high up or not completely divided.

Is the cord sensitive to pain or is it insensitive, like the brain? Elsberg has studied this problem for a considerable time. He finds that the outer surface of the dura is insensitive to touch when it is rubbed or scratched with a needle. However, its inner surface is very sensitive. The surface of the cord is not sensitive to pain excepting along the line of origin of the nerve bundles which unite to form the posterior roots. An incision can be made into the cord without the patient feeling it. The most sensitive part of the posterior roots is at the point where they perforate the dura.

DISEASES OF THE SYMPATHETIC AND SPINAL GANGLIA.

Tumors of the Sympathetic and Adrenals. According to F. Harbitz[9] of Kristiania it was first clearly demonstrated by J. H. Wright[1] that there exist certain peculiar tumors arising from the sympathetic nervous system and the adrenal medulla. They consist of an embryonal, undifferentiated nervous tissue of characteristic structure and are very malignant. The origin of the tumors can be understood only by considering the embryology of the sympathetic and the adrenals. While the adrenal cortex already appears in the fourth week of foetal life as an epithelial thickening the medullary portion is formed from portions of the sympathetic nervous system which wander into the cortex and gradually accumulate in its center. These sympathetic formative cells are small, and resemble lymphocytes. Later they become differentiated into (a) sympathetic ganglion cells with processes and (b) large cylindrical cells of epithelial appearance with large, clear nuclei. Treated with solutions of chromium salts their cytoplasm and to some extent their nuclei show brownish green granules; hence they are called chromophile cells. Similar chromophile cells are seen in the carotid gland, the coccygeal gland, and in the so-called Zuckerkandl organ in the new-born, located in front of the aorta and about the inferior mesenteric artery. It is therefore clear that this whole so-called

---

(9) Norsk Mag. f. Lægevidenskaben, 1915.
(1) Jour. Exp. Med., 1910, Vol. 12.

chromophile system originates from the sympathetic nervous system.

Tumors arising from the adrenal medulla or from the sympathetic nervous system are sometimes designated neuroblastoma and may have very different structure according to the stage of development reached by the cells which form the tumor: 1, tumors consisting of fully formed ganglion cells and fibres, ganglioneuroma or true neuroma; 2, tumors consisting of chromophile cells called paraganglioma; 3, tumors consisting of undifferentiated sympathetic formative cells, the so-called malignant neuroblastoma which seems to be relatively frequent. Needless to say, transitional and mixed forms also occur.

Harbitz first considers the third variety, the malignant neuroblastoma. He reports four cases.

Case 1. This tumor was removed from the anterior surface of the sacrum of a child 3 years old who died on the operating table. The tumor was the size of an orange and very soft. The histologic structure is characteristic.

Case 2. The tumor was obtained at a necropsy on a child 6½ months old who had been ill for one month with diarrhea and abdomenal enlargement. The liver grew very rapidly but there was no jaundice. The liver weighed 1,860 grams and was very irregular both in shape and appearance, being smooth in some places and nodular in others. The tumor nodules were greyish red and very vascular. The left kidney was anteriorly adherent to a greyish brown encapsulated cystic mass of goose egg size. Histologically the structure of all the tumors was that of neuroblastoma which evidently had arisen from the adrenal medulla.

Case 3. This was a large egg-shaped sacral tumor from a premature still born child. The structure was essentially similar to that in the other cases.

Case 4 was also a large sacral tumor from a still born child.

Of the second class, that of ganglioneuroma and true neuroma, some 45 to 50 cases have been reported and are tabulated in a thorough article by Wahl.[2] These tumors most frequently originate from the abdominal

---

(2) Jour. Med. Research, 1914, Vol. 30.

sympathetic ganglia, sometimes the adrenal medulla, and rarely in other nervous structures such as the Gasserian ganglion and the optic nerve. They are most frequent in children, are usually solitary, encapsulated and benign. However, a few ganglion neuromas with tendency to malignancy have been described in children.

Of the third variety, the chromophile tumors, also called paraganglioma, only 12 to 15 cases have been reported, usually as accidental post-mortem findings in adults. They are most frequently located in the adrenal medulla, "struma suprarenalis medullaris," and in the carotid gland.

Finally Harbitz reports a fifth case, of multiple tumors, in a man 47 years old. They were: 1, hypernephroma of the left kidney with metastases in the right kidney, lungs and liver; 2, cyst adenoma of the pancreas; 3, chromophile tumor of the right adrenal; 4, a similar degenerated tumor of the right kidney.

A Case of Malignant Sympathicus Tumor of the Right Adrenal is reported by Daniel J. Glomset.[8] The patient was a child 2 years old. Enlargement of the abdomen had been noted for 4 weeks and the child had lost flesh and had some diarrhea and frequent micturition. The liver extended over two fingers' breadth below the costal arch and its edge was somewhat irregular. Laparotomy was made and a tumor the size of a child's head was found occupying almost the entire right half of the abdominal cavity below the liver. The child died a week later. At the necropsy a rather firm tumor mass was found in the region of the right kidney. It measured 9 cm. in diameter and was bounded above by the liver and pylorus, below by the right anterior superior spine of the ilium and on the left by the spinal column. It was surrounded by a rather thick connective tissue capsule which was united to the upper pole of the right kidney. The right kidney was markedly compressed by the tumor. The right adrenal could not be found and was apparently included in the mass. Numerous tumor masses were seen in the liver. Tumor nodules were also seen in the tracheobronchial lymph nodes, the mediastinal

---

(8) Arch. Int. Med., 1915, Vol. 15, p. 341.

and retroperitoneal lymph nodes, in the bodies of the 4th and 5th thoracic vertebrae, in a rib on the left side and in the medullary substance of the femurs, right tibia, and right ulna. (See Plate X.)

The histologic structure of the primary and metastatic tumors is that of malignant sympathicus tumor or "malignant neuroblastoma." The rosette formation as seen in Plate XI is very striking and leads the author to call attention to the many similarities between this type of tumor and the so-called neuro-epitheliomas or neurogliomas of the retina. Both types occur in the young; both are composed of cells with chromatin-rich nuclei and fibrillar cytoplasm; both have rosettes; both are malignant with tendency to multiple bone metastases.

[The subject of malignant sympathicus tumors was discussed in the Practical Medicine Series, 1912, Vol. X, p. 176, in connection with a report by Ludwig Pick.—Ed.]

Ganglioneuroma of the Sphenomaxillary Fossa removed by operation, in a boy 3 years old, is reported by John Shaw Dunn.[4]

"A swelling was first noted three weeks before operation on the right temple, just behind the frontal process of the right malar bone. It was apparently of the size of a marble, and had a cystic feeling. At the operation on May 12, 1915, it was found that the tumor was entirely covered by the temporal muscle, and when the latter was withdrawn it was seen to be encapsuled. When removal was attempted it was found that the tumor lay directly on the bare bone of the wing of the sphenoid, there being no intervening periosteum. The upper part was separated off readily enough, but a prolongation was found to extend downwards into the spheno-maxillary fossa. This part was ligated as low as possible, but the tumor could not be removed intact. It was remarked after removal that there had been a fairly complete capsule. The contents resembled grey matter of the brain."

After a detailed histologic description we learn:

"In summarizing the histological features, it may be observed that the special staining methods employed leave no doubt as to the nature of the fibrous parts of

---

(4) Glasgow Med. Jour., Aug., 1915, p. 98.

the tumor; they represent a tumor of nerve-cells, in which ganglion-cells, sheath-cells, and axis-cylinders are typically represented. The aberrant forms of ganglion-cells which occur are only such as might be expected in a tumor, and such as have been frequently described in tumors of this kind. As regards the cellular parts, the two most salient features are the presence there of axis-cylinders, though less numerous than in the fibrous parts, and the occurrence of a few scattered ganglionic cells. These facts indicate that this also is nervous tissue, and its richness in small cells of embryonic type is simply to be explained by the assumption that it is nervous tissue of embryonic character, or, at any rate, of a low degree of maturity. It further seems certain that the spindle-shaped forms are early forms of sheath-cells, while the rounded cells may be either the predecessors of ganglion cells only or may be more primitive forms of neuroblast, from which any of the various forms of nerve-cell may develop. It is to be noted that the presence of such neuroblastic tissue is of unfavorable omen as regards prognosis, for it is just such embryonic tissue, with its high potentiality for proliferation, which is liable to develop malignancy.

"The exact origin of the tumor it has not been possible to determine, in absence of a more complete dissection. The nearest ganglionic structure would be the sphenopalatine ganglion, in relation to the superior maxillary division of the fifth cranial nerve. This ganglion, like all the others on cranial nerves, contains elements belonging to the sympathetic nervous system, a fact which would be so far in favor of attributing the tumor to that origin."

Affections of the Sphenopalatine or Nasal Ganglion (Meckel's Ganglion). Greenfield Sluder[5] seven years ago described the symptoms of neuralgia of this ganglion. After a more or less severe coryza, pain begins at the root of the nose, in and about the eye, the upper jaw and teeth, sometimes also in the lower jaw and teeth and extends backward about the zygoma to the ear. The pain is most severe behind the mastoid and is also felt

---

(5) **Lancet-Clinic, Apr. 24, 1915.**

in the mastoid itself, extends backward to the occiput and neck and even to the shoulder and arm. There may be also "stiffness" and aching in the throat or pain in the region of the hard palate. The sense of taste is slightly less acute over the anterior two-thirds of the tongue on the affected side. Such attacks of pain resemble those of maxillary and vidian neuralgia excited from within the sphenoidal sinus. If due to an affection of Meckel's ganglion cocainization of this structure gives relief, which is not the case when it originates from the sphenoidal district. Applications of 2 per cent. silver nitrate or 1 per cent. formaldehyde to the membrane of the sphenopalatine foramen often cure the mild and subacute cases, while in severe ones injections of alcohol are required. The author adds 5 per cent. phenol to the 95 per cent. alcohol. A straight needle is inserted over the posterior tip of the middle turbinate to a depth of 0.5 cm. or a curved one to the same depth through the sphenopalatine foramen. When to the picture given above, vasomotor and secretory symptoms are added we have what the author calls the sympathetic syndrome of the nasal ganglion neurosis. Regardless of the season of the year, the patient, in addition to neuralgic pain, is suddenly "seized with severe and protracted sneezing, accompanied by much nasal congestion and thin, hot secretion, so profuse as to have him resort to a towel to use as a nose cloth. With the great congestion of the nasal fossæ is seen great redness (congestion) and swelling of the external nose, and soon thereafter appears more or less roughening of the skin from the secretion and the wiping it necessitates. In addition to these symptoms, the eyes are greatly reddened (congestion of the conjunctiva) and bathed in tears of a profusion corresponding to the nasal secretion, accompanied by dilatation of the pupil. They are involved almost, if not quite, simultaneously with the nose. A sense of itching or burning or a feeling of wind blowing into them accompanies the lachrymation, together with a feeling of discomfort of a peculiar kind which seems independent of the secretion and congestion, and there may be photophobia. Work requiring near vision is usually very difficult or not possible under these conditions. Sometimes these symptoms are accompanied by dyspnea with dry rales.''

That this condition is due to affection of the nasal ganglion is shown by the relief obtained by cocainization of the ganglion.

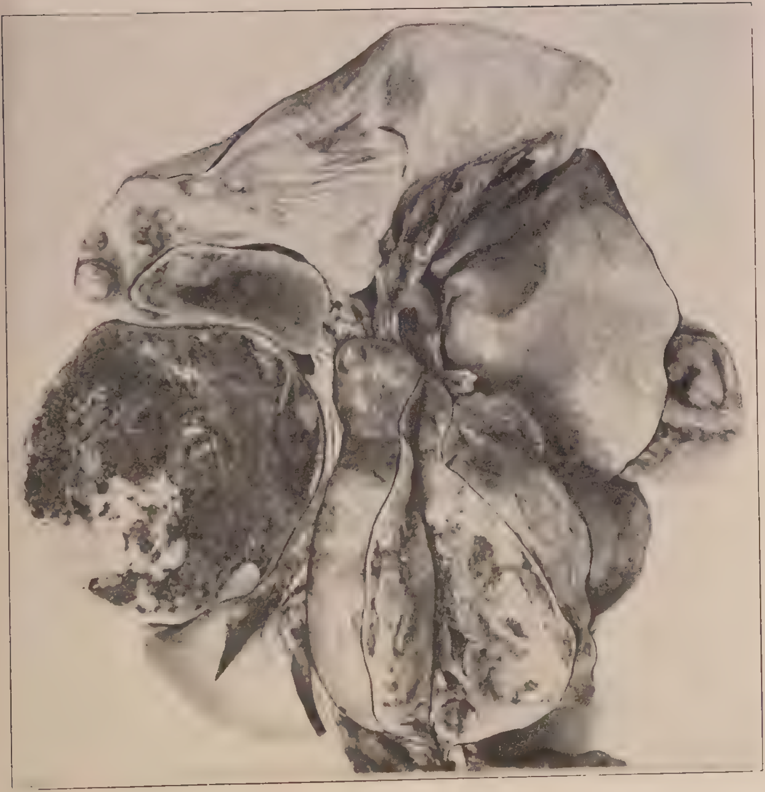
The Etiology and Experimental Production of Herpes Zoster. E. C. Rosenow and Sverre Oftedal[6] credit Head and Campbell with proving, on a large material, that herpes zoster is due to lesions of the posterior root ganglia, and Sunde with the first demonstration of bacteria in the ganglia. [See Practical Medicine Series, 1913, Vol. X, p. 150.] The present authors produced herpes of the skin, tongue or lips and lesions in the corresponding ganglia in 46 rabbits and other animals by intravenous injection of the bacteria in emulsions of extirpated tonsils, of mixed cultures and pure cultures of streptococci obtained from tonsils or pyorrheal pockets, and of streptococci in pure culture from the spinal fluid. In several animals herpetiform lesions of the viscera were found, and in these the ganglia of the vagus or sympathetic nerves were found to be hemorrhagic.

The lesions of the ganglia consist chiefly of hemorrhages and round-celled infiltration, usually most marked just beneath and outside the capsule and surrounding alveolar tissue and along the sheath of the corresponding nerve. The blood vessels commonly show marked congestion, and at times are completely or partially filled with mononuclear and polynuclear leucocytes. Gram-staining cocci in pairs and short chains have been found to occur quite constantly in the areas showing lesions in and about the ganglia, but not in the normal portions. Cocci have been found in these lesions, by cultures and sections, when absent in the blood and other tissues. The following is the protocol of one of the experiments: A dog was injected intravenously on Feb. 20 with the growth from 45 c.c. of ascites-dextrose tissue broth of a pure culture of a rather long-chained green-producing streptococcus from the tonsils removed on the second day after the onset of a typical attack of herpes zoster.

---

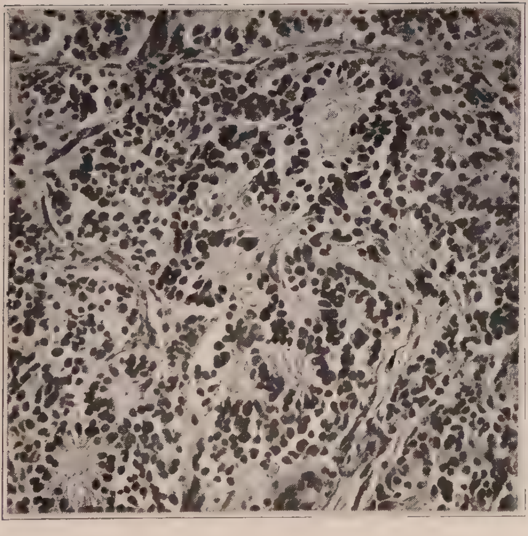
(6) Jour. Amer. Med. Ass'n., 1915, Vol. 64, p. 1968.

PLATE X.



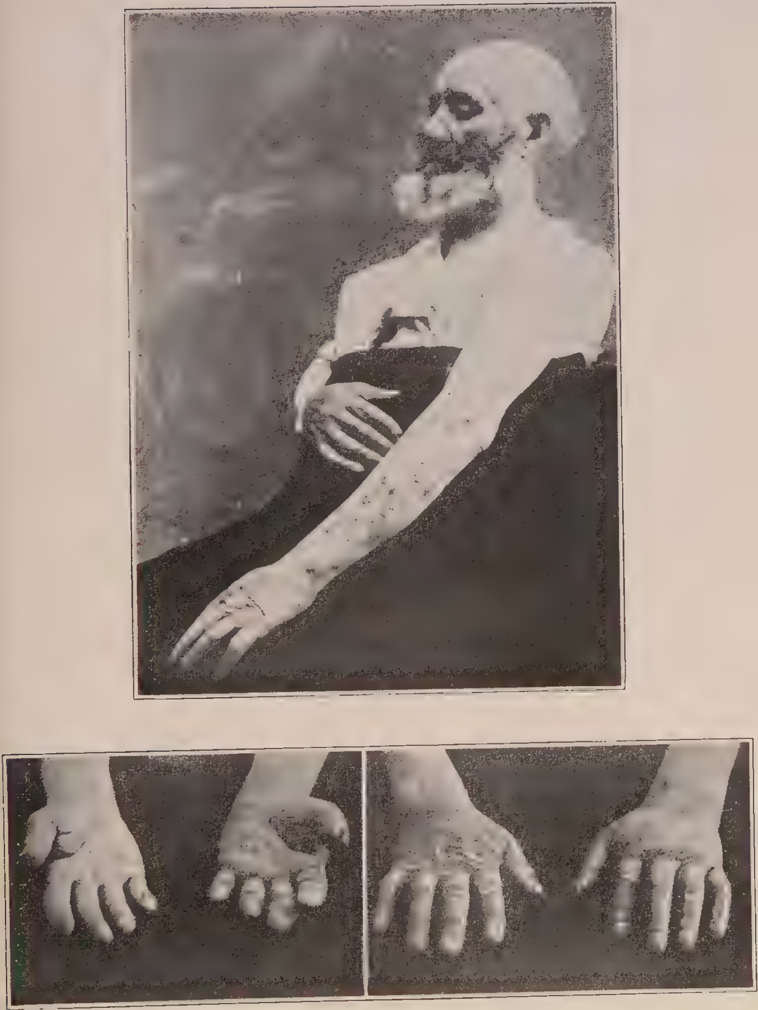
Malignant sympathicus tumor of the right suprarenal. Main tumor and neighboring organs. The tumor has been cut into halves and the surface made by section shows large areas of necrosis and numerous hemorrhages. The right kidney is compressed by the new growth. The liver is seen studded with tumor nodules.—Glomset (see page 140).

PLATE XI.



Photomicrograph (retouched, × 75) from small nodule in liver. The fibrillae of the rosettes stand out prominently.—Glomset (see page 140).

PLATE XII.



Herpes zoster and radicular paralysis of upper extremity.—Souques, Baudouin, and Lantuéjoul (see page 145).

Feb. 21. Seems ill and keeps rubbing the left side of the head with the front paw.

Feb. 22. Seems better, but still rubs the left side of the head gently and slowly.

Feb. 23. Seems about the same as yesterday. Chloroformed and examined at once. The under surface of the skin of the left side of the forehead shows a number of hemorrhagic vesicles from which exudes a large amount of sero-sanguineous fluid when cut across. A few similar lesions are found in the subcutaneous fat over the lumbar region on the right side corresponding to the last dorsal vertebra. Under the vesicle on the left side of the head the periosteum is hemorrhagic over an area 0.5 by 1 cm. The left Gasserian ganglion shows a small hemorrhagic area. The spinal cord was not removed. The spinal fluid is turbid and contains a moderate number of large and small mononuclear cells. No other gross lesions.

Feb. 24. Cultures in ascites-dextrose broth from spinal fluid and hemorrhagic ganglion give pure cultures of short-chained streptococci, while those from the blood are sterile.

Herpes Zoster with Radicular Paralysis of the Arm. Souques, Baudouin and Lantuejoul[7] describe a case of herpes zoster of the left arm along the posterior surface as seen in Plate XII and in text Fig. 2. The left hand was habitually held in a position of flexion of the terminal phalanges and of the first phalanx of the thumb. All finger movements were impaired; abduction of the thumb and complete extension of the other four fingers was impossible and their abduction and adduction greatly limited. While the wrist movements were normal, those at the shoulder were limited, and a certain amount of stiffness of the shoulder was present. Extension of the elbow was greatly impaired and flexion slightly so. The grip was very weak. Sensation to touch and pain was diminished in the corresponding cutaneous area. Fifteen days after the onset markedly impaired faradic excitability was demonstrable in the triceps and the extensors of the fingers and thumb. Both the paralysis and sensory

---

(7) Nouv. Iconog. de la Salpetrière, 1915, Vol. 27, p. 25.

disturbance involved most completely the muscles and skin supplied by the portions of the brachial nerves originating from the fifth cervical nerve. It is assumed that the inflammation has extended from the root

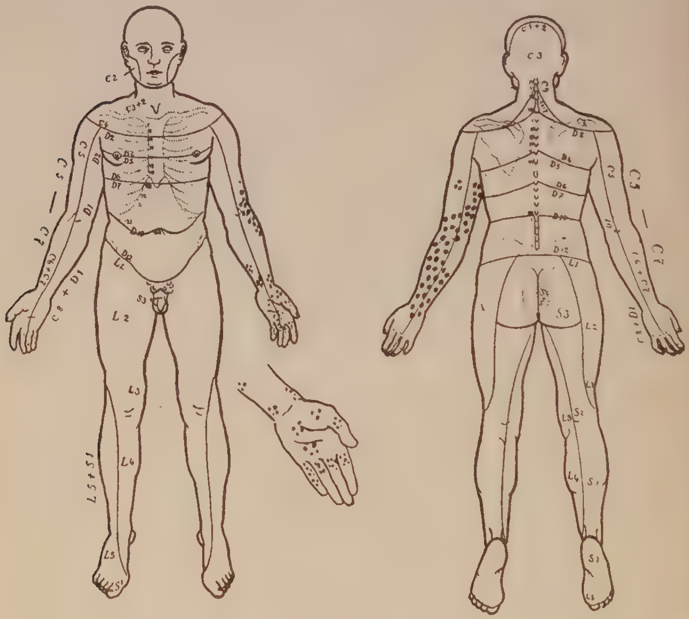


Fig. 2.

ganglion to the anterior roots, thus causing the paralysis. The occurrence of the latter is a rare phenomenon in herpes zoster of the arm.

DISEASES OF THE PERIPHERAL NERVES.

Wounds of Nerves by Bullets, Shrapnel, etc., have been studied by J. Babinski.[8] Among sources of error in diagnosis are wounds of tendons and muscles, and occasionally there may be considerable difficulty. The elec-

---

(8) Rev. Neurol., May-June, 1915, p. 274.

tric reactions are sometimes helpful. In case of muscle or tendon wounds contractions are produced by the faradic current and retraction of the skin may be noted over the point of severance. Associated hysterical phenomena are frequent and must be distinguished from those dependent on the mechanical nerve injury. Thus, a soldier with a shrapnel wound of the left subclavicular region had complete paralysis of the whole arm of one month's standing. Electric examination revealed reaction of degeneration only in the muscles innervated by the musculo-cutaneous nerve (biceps and brachialis anticus); so Babinski suspected the greater part of the paralysis was hysterical and told the patient that the electric current would enable him to move the arm. The scheme worked like a charm; in a few minutes the soldier could move all the muscles in the arm except those which gave the reaction of degeneration. Similarly, a paralysis of the flexors of the fingers of hysterical origin was instantly cured in a soldier who had paralysis of the circumflex, musculo-spiral and musculo-cutaneous nerves from a penetrating gunshot wound of the axilla. Again the normal electric reaction of the flexors led to the correct separation of the functional from the organic paralysis. As usual, some of these superadded hysterical paralyses were caused by suggestion on the part of the surgeon who first examined the patient.

Complete section of a nerve trunk by a bullet is rare in Babinski's experience. More commonly the separation is incomplete, with subsequent thickening, a sort of neuroma formation. The patients often mention having had, at the moment they were shot, a sudden, violent pain, like an electric shock, in the distal part of the limb. This may possibly be a symptom of section of a nerve.

Babinski has had many occasions to confirm the old observations of Duchenne that the faradic excitability of a previously paralyzed muscle may not have returned when voluntary movement has been restored to a considerable extent.

In several cases of median nerve paralysis he observed that on faradizing the biceps the flexion was accompanied by very pronounced supination, while on the other side the supination was much less marked. Babinski believes that this hitherto undescribed phenomenon is due to the paralysis of the pronators supplied by the median nerve, which thus are prevented from counteracting the supinating action of the biceps. The author has noticed that the latter action of the biceps varies greatly in different healthy individuals.

Although bullets may take any conceivable course, certain groupings of lesions are more common. Thus in wounds of the axillary region the circumflex, musculocutaneous and radial nerves are apt to suffer together and the same is true of the median and ulnar nerves. Vasomotor and secretory troubles commonly occur in cases of wounds of nerves. The temperature of the extremity affected is often different from that of the normal side. It may be higher or lower and sometimes certain parts of the limb show increase in temperature and other parts a decrease. Thus, in a case of gunshot wound of the sciatic nerve in the middle third of the thigh, the foot and lower part of the leg were cold while the upper part of the leg and the lower part of the thigh showed a higher temperature than the normal side.

Babinski found in many cases that the improvement was more rapid than he had expected and this is probably due to the relatively greater frequency of contusions and partial lacerations than of complete severing of nerves.

Operations were frequently performed. Severed nerves were sutured, but more frequently the nerves merely had to be freed. In some of the older cases the nerves were surrounded by a thick layer of fibrous tissue. The relief from pain after such liberation of a nerve is often very rapid and striking.

Contractures and adhesions of tendons and fasciae often become very troublesome and should be guarded against, especially by massage and appropriate exercises.

In the discussion of this paper, Dejerine stated that in all cases of suspected injury of a peripheral nerve, an exploratory incision should be made to determine the actual condition of the nerve, as neither the extent of paralysis or anesthesia nor the electric reactions permit us to state whether a nerve is completely or partly cut, surrounded by scar tissue, or compressed by a fragment of bone or bullet. When the nerve is compressed by scar tissue more or less severe pain is present, which disappears as soon as the nerve is freed.

The Clinical Individuality of Peripheral Nerves is the title of a paper presented to the Paris Neurological Society by Pierre Marie and Athanassio-Benisty.[9] While most peripheral nerves are both sensory and motor they seem to show certain individual peculiarities. Thus, in the arm, lesions of the musculospiral nerve chiefly cause paralysis, those of the ulnar chiefly deformity of the fingers and those of the median pain, vasomotor and trophic disturbances. When pain occurs with wounds of the musculospiral nerve it is usually caused by associated bone or joint lesions. In the case of the median nerve, on the other hand, pain is likely to become the prominent symptom within a few hours after the injury. Frequently there is produced a veritable median neuritis, characterized by an intense, burning pain aggravated by pressure along the nerve. The authors, who have studied a large number of wounded soldiers at the Salpêtrière, have never seen a similar condition in connection with wounds of the musculospiral nerve. Wounds of the ulnar nerve may cause severe pain at the time of injury but persistent neuritic symptoms have not been seen unless the median nerve also is injured. In the painful median neuritis the motor phenomena are not marked, the paralysis being usually limited to the flexors of the second and third fingers. In musculospiral paralysis the extensors of the fingers are most constantly paralyzed and in the case of the ulnar nerve, the interossei. After complete paralysis of any of these nerves the muscles inserted at the wrist usually recover first, probably because their nerves are given off higher up in the nerve trunks than those supplying the muscles which move the fingers. During the period of recovery one observes involuntary movements; in the case of the median nerve a fine irregular tremor, chiefly in the second and

---

(9) Rev. Neurol., May-June, 1915, p. 280.

third fingers, increased on voluntary efforts; in the case of the ulnar nerve, coarser clonic movements of the last two fingers, increased on efforts at straightening them. The normal electric reactions are more rapidly and completely lost in the case of the musculospiral nerve and usually comparatively well preserved in the case of the ulnar nerve. Complete anesthesia is rare, more frequently a light hyperesthesia. The sensory disturbance is usually more marked when the ulnar nerve is injured. Hyperesthesia is rare except in the type of median neuritis described above in which the stereognostic sense (ability to recognize objects) is also profoundly affected, although motion and tactile sense are little altered. Vasomotor disturbances are extremely rare in the case of the musculospiral nerve injuries, slight and variable in ulnar nerve lesions, but almost constant in the case of the median nerve. The hand is cold and bluish with abundant perspiration. The skin is thin and finely wrinkled in the palm. Trophic disturbances are noted not only in the skin but also in the bones, especially in connection with the painful median neuritis, in which the *x*-ray reveals considerable decalcification. This bony atrophy seems to be more pronounced after prolonged immobilization.

In the case of the *lower extremities*, wounds of the trunk of the *sciatic nerve*, like those of the median, are very painful, and the intensity of the pain to some extent is in inverse proportion to the extent of the paralysis. When the internal popliteal division of the sciatic nerve is chiefly affected, vasomotor disturbances are pronounced, while in the case of the external popliteal, paralysis and loss of sensation predominate. Wounds situated below the bifurcation of the sciatic nerve are usually not associated with much pain.

Two principal types of *sciatic paralysis* may therefore be distinguished:

1. *Paralysis with little or no pain.* The muscles most constantly affected are those supplied by the external popliteal nerve, the peroneal muscles, the tibialis anticus and the extensors of the toes. Restoration of function is always slow. Of the anteroexternal muscles of the leg the

tibialis anticus usually recovers first. The electric reactions are usually markedly affected. While the knee jerk remains active, the ankle jerk is lost when the internal popliteal division is affected. When pain is present the ankle jerk may be lost in the absence of paralysis of the calf muscles. Loss of sensation is usually extensive. Vasomotor disturbances are frequent and most marked when the internal popliteal fibres are involved, in which case there may be edema of the dorsum of the foot, blueness of the skin and lowered local temperature. However, in certain cases of complete section of the main sciatic trunk the foot may be warmer than the normal one. Atrophy of the muscles is commonly seen.

2. *Painful paralysis.* In this form the paralysis, which may be marked during the first few weeks, often disappears rapidly. Motion first returns in the flexors of the toes and the calf muscles, later in the extensors and the peroneal group. The Achilles jerk is always abolished. Anesthesia is less pronounced than in the other form but hyperesthesia of the sole of the foot and the toes is marked. The spontaneous pains are of exceptional severity, more marked during the night, and may prevent sleep for weeks unless morphine is given. The pain is chiefly felt in the foot and ankle and rarely extends above the knee. Operation on the nerve appears to have no influence on the pain, which only disappears spontaneously and gradually. The vasomotor and trophic phenomena are similar to those of the first group.

Cases of Nerve Concussion Due to Bullet and Shell Wounds. A. H. Tubby,[1] surgeon in the British army, reports eight cases of "nerve concussion." He introduces his subject by saying that in addition to gross anatomical injury a physiological blocking may occur and produce only temporary effect. It may be that the nerve is deflected out of its course and slightly stretched, or is pressed upon by effusion of blood, or receives a blow transmitted to it through a portion of muscle, or is itself jammed against the bone for a short time. Whatever the cause, it results in a temporary disintegration or temporary disturbance which renders the neuron in-

---

(1) British Med. Jour., Jan. 9, 1915.

capable of allowing impulses to pass through. Recovery is the rule.

After briefly describing the eight cases, the author says:

"It is a little difficult to gather what is the general acceptation of the vague term 'concussion of nerve.' Perhaps the following definition may prove acceptable: It is damage done to a nerve trunk without actual destruction of the axis cylinders; and the damage may consist of an effusion of blood between the fibres, following compression of the nerve against a bone by the rapid passage of a foreign body in the immediate neighborhood of the nerve. In other cases the actual lesion may not amount to hemorrhage, but to a temporary anemia, or its opposite, hyperemia of the nerve, and we require specimens for microscopical examination before we can be quite precise. It is also possible to conceive that in certain large nerve trunks, such, for instance, as either of the popliteal nerves, where the motor fibres can be split up for a very long distance from the sensory, either a motor or a sensory bundle may be injured, so that in one case motor paralysis alone may exist and in another sensory symptoms be present."

In all cases a stereoscopic skiagram is taken to determine whether any fragments of shell or bullet or bone splinters are present, and if so the fragments are removed. The electric reaction of muscles and nerves should be tested. A partial and irregular paralysis of the muscles supplied by one nerve trunk is indicative of physiologic blocking. If there is constant pain in the distribution of the nerve below the lesion, and if there is great tenderness of the nerve trunks, then the probabilities are that we are dealing with a concussion which has been followed by traumatic neuritis. Pain is often extremely obstinate to treatment in these cases and is felt long after the return of motion and sensation. The absence of trophic lesions of the skin is indicative of absence of gross destructive lesions of the nerve. Light massage, hot air and the static current of high voltage have been found useful in relieving the pain. Drugs are not very successful, though a combination of codeine, pyramidon and caffein may be useful. The author warns against haste in operating on nerves.

War Injuries of the Peripheral Nerves. Like the French observers, Oppenheim,[2] on the basis of his experience in Germany, states that injuries to the peripheral nerves are the most frequent lesions met in the "neurology of war." He also finds wounds of the arms more frequent than of the legs, and that the musculospiral nerve is the one most often affected. The median and ulnar nerves were also often injured, and in wounds of the axilla several nerves are naturally often injured together. As to the complications of fracture, thrombosis and aneurysm, Oppenheim warns the neurologist that aneurysm is easily overlooked. Together with traumatic neuritis, extensive myositis often occurs. As a rarity the author mentions traumatic neuritis limited to the branches of the lower thoracic nerves supplying the abdominal wall, causing paralysis of the abdominal muscles, loss of abdominal reflex and diminished sensation over the abdomen. On account of the pain this condition may be mistaken for appendicitis.

In a general way the experience of the war, according to Oppenheim, has demonstrated the marked preponderance of damage to the sensory part of the nervous system. He dwells on the following four points:

1. The tremendous severity of the pain in many of the cases, especially those of injury to the plexuses. The degree of pain was such as occasionally to drive the patients to complete frenzy. Large doses of morphine gave only transient relief. The conditions necessary for the occurrence of this excessive pain are not easily determined. They are more frequent in cases of partial injury to nerves than in complete interruption of conduction. Further experience must determine the rôle of the mechanical force, of the individual disposition, and the question whether the pain is produced by the primary injury or by a subsequent traumatic or infectious neuritis.

2. The prominence of anesthesias as compared with

---

(2) Berlin. klin. Wochenschr., Nov. 30, 1914, Vol. 51, p. 1853.

injuries in times of peace. In cases of trauma to the peripheral nerves we ordinarily find loss of motor power in the foreground. Thus, in the ordinary pressure paralysis of the musculospiral nerve, loss of sensation is usually not present, while in the war injuries of this nerve, such loss is practically always present and usually very marked.

3. The frequency of isolated involvement of the sensory fibres in the trunks of mixed nerves. Oppenheim has particularly observed this in cases of injury to the sciatic nerve.

4. The tremendous influence of the traumatic neuritis of sensory paths on the mind and on the vasomotor and secretory systems. First of all there are attacks of excitement, mental confusion, and outbreaks of fury provoked by the pain. These symptoms usually occur intermittently. Then we have the great sensitiveness toward all sensory stimuli and emotions, and the great influence of the latter on the intensity of the pain. This leads the patient to attempt to isolate himself completely, as the mere opening of a door or the ringing of a bell may bring on a paroxysm of pain. Are these individuals all naturally nervous and hysterical? Has the war made them nervous? Or has the severity of the pain so damaged the mind as to bring about this tremendous hypersensitiveness? Oppenheim lays greater stress on the molecular changes brought about in the central nervous system by the shock of the injury. [This is in line with his theory of the traumatic neuroses discussed elsewhere in this volume, page 9.] This interpretation helps to explain the frequency of vasomotor and secretory disturbances of general distribution, *i. e.*, not limited to the injured limb. Thus, one of his patients, with a gunshot wound of the sciatic nerve causing violent pain in the foot, had redness of the face and hands with a severe burning sensation in the hands, and every movement of the fingers caused severe pain in the injured foot. Besides in this, as in other cases, there was marked general hyperidrosis.

Another fact which has surprised the author is the behavior of the electric reactions in the paralyzed motor nerves. While we meet with the typical partial and complete reaction of degeneration, it is striking that the stage of slow, worm-like muscular contractions on direct galvanic stimulation, which ordinarily sets in after a week, may not be reached for four or six weeks or even longer. This adds to the difficulty in coming to an early conclusion as to whether a nerve is severed or merely contused.

War Wounds of the Peripheral Nerves were discussed by the well known German author of large treatises on diseases of the peripheral nerves, M. Bernhardt,[3] who died before the article was printed. He reviews at length the various reports which have been made in Germany and Austria during the present war. These reports agree with the French ones already mentioned that the musculospiral nerve is the one most frequently injured. As to the much discussed indications for operation on injured nerves the author states that it is generally agreed that such operations should be postponed in the presence of suppuration, and in the case of associated fractures one should wait until the bones have united. However, some authors maintain that severe neuritic pains indicate an operation for freeing the nerves at an earlier stage. It is also agreed that one should not operate on paralyzed nerves when the electric reactions are not at all or only slightly altered. There is difference of opinion as to the best time for operating in cases of paralysis with complete reaction of degeneration. Thus, Grulanos, who gained his experience in the Balkan wars, advises operating between the fourth and sixth week after the injury, but the majority both of surgeons and neurologists believe it is better to wait four to six months. The author agrees with the latter view. If the nerve is found severed, suture is of course indicated. If it is not severed but the site of a scar, it is recommended to excise the cicatrized portion and suture the ends. Several cases are reported in detail.

Articular and Trophic Complications of Wounds of the Median Nerve. J. Dejerine and E. Schwartz[4] de-

---

(3) Berlin. klin. Wochenschr., 1915, Vol. 25, p. 309.
(4) Rev. Neurol., May-June, 1915, p. 414.

scribe the case of a soldier who was wounded in August, 1914. He had a sudden sensation as if his left arm was broken, and the left hand felt numb just as a bullet penetrated the forearm. He suffered considerably from paresthesias in the hand and finally was admitted to a hospital in Paris on Dec. 29. The first four fingers had their joints ankylosed, the first phalanges in flexion, the other two phalanges in extension. There were several papules on the fingers. The nerves of the forearm were exposed, but no lesions were found. The affected fingers perspired very freely and the nails became very soft and flexible with marked longitudinal and transverse lines. The case is interesting as it demonstrates that irritative lesions of the median nerve may produce joint lesions identical in appearance with those of chronic arthritis.

Polyneuritis of Mixed Nerves in Neurasthenic Soldiers. Nonne[5] in his observations on soldiers taken ill after exhausting marches finds many cases confirming Edinger's exhaustion theories (reviewed on page 7 of this volume in connection with an article by Auerbach). The patients were free from syphilis, alcoholism or other intoxications or infections and yet, after prolonged marches, three of them developed multiple neuritis, chiefly involving the anterior crural and posterior tibial nerve areas, which include the muscles most used in walking, namely: the extensors of the knee and the flexors of the ankle. Another soldier, who carried his rifle in the right hand, dragged for many hours a wounded comrade with his left hand, and developed neuritis of the three chief arm nerves: ulnar, median and radial. All of these men were previously entirely healthy.

Nonne confirms the recent work of Mann, who observed multiple neuritis developing in soldiers who previously presented marked signs of neurasthenia. He adds two cases. The first patient was an officer 38 years old, of neuropathic heredity, who had for years presented ordinary neurasthenic symptoms. None of the usual causes of multiple neuritis, such as alcoholism or infections, was present. After a few weeks of exhausting

---

(5) Deutsche Zeitschr. f. Nervenh., 1915, Vol. 53, p. 464.

marches he received a slight flesh wound and was sent home. The general nervousness increased, and at the height of this exaggerated state of nervous exhaustion and anxiety he developed multiple neuritis, first involving the left arm, then both legs and finally the right arm. At first there were paresthesias and severe pain; later also motor weakness. Both the neuritis and the functional trouble rapidly improved; so he was almost entirely well in a couple of months. The second patient, an officer 40 years old, also previously severely neurasthenic, developed an acute "nervous breakdown" after severe marches, and two months later pronounced multiple neuritis of the mixed nerves of the lower extremities, in this case also in the absence of the usual causative factors. There was an unusually marked involvement of the muscles of the thigh and of the flexors of the ankle. After three months he was almost well.

These cases are of great interest as tending to show that Mann is right in assuming the existence of a "polyneuritis neurasthenica." It is noteworthy that the neuritis did not develop immediately after the muscular exertion but after weeks or months of rest necessitated by simple nervous exhaustion. [Although these patients were not victims of alcohol or lead intoxication and had not recently gone through any infectious disease, it must be borne in mind that it is very difficult to exclude a focus of infection somewhere in the body, and it is only natural that in the presence of a generally exhausted state a slight infection such as may exist in buried tonsils or pyorrhoea may really have been the direct cause of the multiple neuritis. For most of us it is difficult to believe that so-called neurasthenia in itself can lead to such definite local organic disease as multiple neuritis. —ED.]

The article by L. Mann[6] to which Nonne refers is entitled "Polyneuritis Accompanying States of Nervous Exhaustion in War." Mann is impressed by the large number of cases of neuritis, both localized and multiple, met with among the soldiers. The localized forms usually are of "rheumatic" origin as conditions in the field are

---

(6) Neurol. Centralbl., Mar. 1, 1915, Vol. 34, p. 150.

very conducive to rheumatic disorders. Above all his attention has been attracted to a certain type of multiple neuritis occurring in neurasthenic subjects in the absence of alcoholism, diabetes or other usual etiologic factors. Prolonged marches and scanty food combined to produce states of severe exhaustion in which insomnia, mental depression, pressure sensation on the head and other neurasthenic symptoms were pronounced. The neuritic symptoms were almost purely sensory, chief among them being sensation of numbness, while pain was rarely severe. The nerve trunks were tender and areas of impaired sensation were extensive. Pain and temperature sense was usually more affected than tactile sense. The duration of the disease was prolonged over many months. Mann believes that this form of neuritis is of similar pathogenesis to that observed in the states of cachexia or malnutrition accompanying carcinoma, tuberculosis, diabetes and senility.

MISCELLANEOUS.

The Charcot-Marie Type of Muscular Atrophy was first described by the men named in 1886, and a little later in the same year by Tooth of London. This year Souques[7] reviews the subject and reports two cases. The disease is distinctly hereditary and is said to affect the male sex in the proportion of five to one. The onset is usually in childhood with atrophy beginning in the feet, gradually ascending to the thighs. Later the upper extremities become affected, beginning in the hands. The trunk, neck and face usually escape, and the distal portions of the extremities are more affected than the proximal ones. Fibrillary twitchings and vasomotor disturbances occur. Sensation may or may not be altered. Reaction of degeneration occurs in the atrophic muscles. In some cases the atrophy remains confined to the peroneal group of muscles of the lower extremities. The differentiation from other forms of muscular atrophy is

---

(7) Nouv. Iconog. de la Salpetrière, 1915, Vol. 27, p. 173.

usually easy on account of the distribution and the associated vasomotor and electric changes. The rare condition known as hypertrophic interstitial neuritis may offer difficulty, and some authors even consider the two diseases identical, which is not correct according to Souques, as the pathologic anatomy of the two diseases is distinct. In the Charcot-Marie disease there is simple atrophy of muscle without marked interstitial changes; there is a certain amount of atrophy of the anterior horns of the cord and of the motor fibres of the peripheral nerves without much change in volume of the nerve trunks. In the hypertrophic neuritis of Dejerine and Sottas, on the other hand, the peripheral nerves and the nerve roots are greatly enlarged on account of an enormous hypertrophy of the sheaths of Schwann.

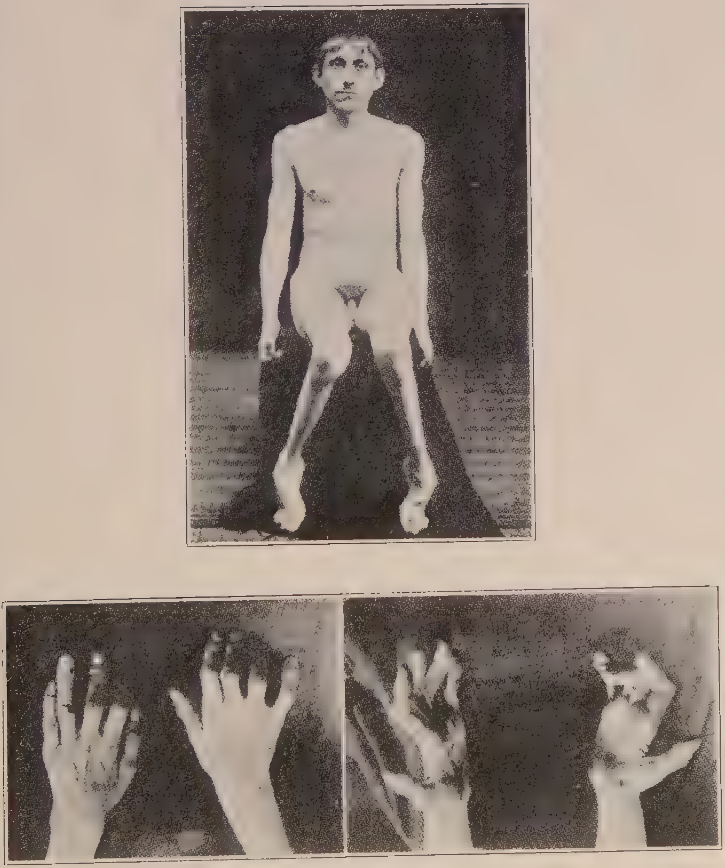
The first patient described by Souques (Plate XIII) belongs to a family 19 members of which are known to be similarly affected. The lower extremities became affected at 11 years, the upper ones three years later. The characteristic appearance of the extremities is shown in the illustrations, obtained when the patient was 25 years old. The atrophy below the knees is marked and the feet are in equino-varus position. The hands also show marked atrophy and deformity. The second patient (Plate XIV) is a relative of the first one, and the disease, which also commenced in the feet, was discovered so early that it may have been congenital, although no certain congenital case is on record. The appearance of the hands and feet is shown, from photographs obtained at the age of 47.

Myotonia Atrophica. As reports accumulate, this rare and peculiar muscle disease is being recognized as an independent affection. At first it was merely considered a variety of myotonia congenita, or Thomsen's disease, in which, in addition to the characteristic myotonic condition, there happened to be some isolated atrophic muscles. The atrophy usually involved the same muscles in all the cases, namely: the orbicular muscles of the mouth and eyes, the temporals and masseters, the vasti muscles of the thighs and the muscles of the anterior tibial groups. In this country cases have been reported by J. Ramsay Hunt,[8] Kennedy and Oberndorf[9] and Kennedy.[1] In the last named case, as in several others reported from Europe, bilateral cataract also existed. While the disease frequently is familial, this tendency is much less marked than in Thomsen's disease. Greenfield[2] reports a family with two cases of premature cataract, three of myotonia atrophica and two afflicted with both conditions. Tetzner[3] is convinced that trauma may be the exciting but not the essential cause of a considerable number of cases, while it plays a much smaller rôle in Thomsen's disease. A very recent contribution is that of Hans Curschmann,[4] who also is convinced of the nosological independence of this disease, in which he considers the dystrophic element more important than the myotonic one, so the term "dystrophia myotonica" would be preferable to myotonia atrophica. In the whole literature there is only one case in which this condition developed in a case of previously typical Thomsen's disease. He also finds that when the disease is familial the family history is one of dystrophy and not of Thomsen's disease. He reports the case of a man 43 years old whose father had been similarly affected. At the age of 24 years a condition suggestive of tetany affecting both hands, associated with double vision, existed for about two weeks. Five years later, after a fall, these symptoms returned and the muscular stiffness persisted and diplopia appeared occasionally. At the age of 38 the gait became unsteady; he had paresthesias and sometimes pain in the legs, but not stiffness. From the very onset the speech was somewhat indistinct, and it was difficult for the patient to speak loudly. Examination revealed atrophy and weakness of the orbicularis of the eyes and mouth; the sternomastoids were thin and flaccid, but not paretic; the musculature of the extremities was poorly developed, but the only muscle showing distinct local atrophy was the left supinator longus. Active

---

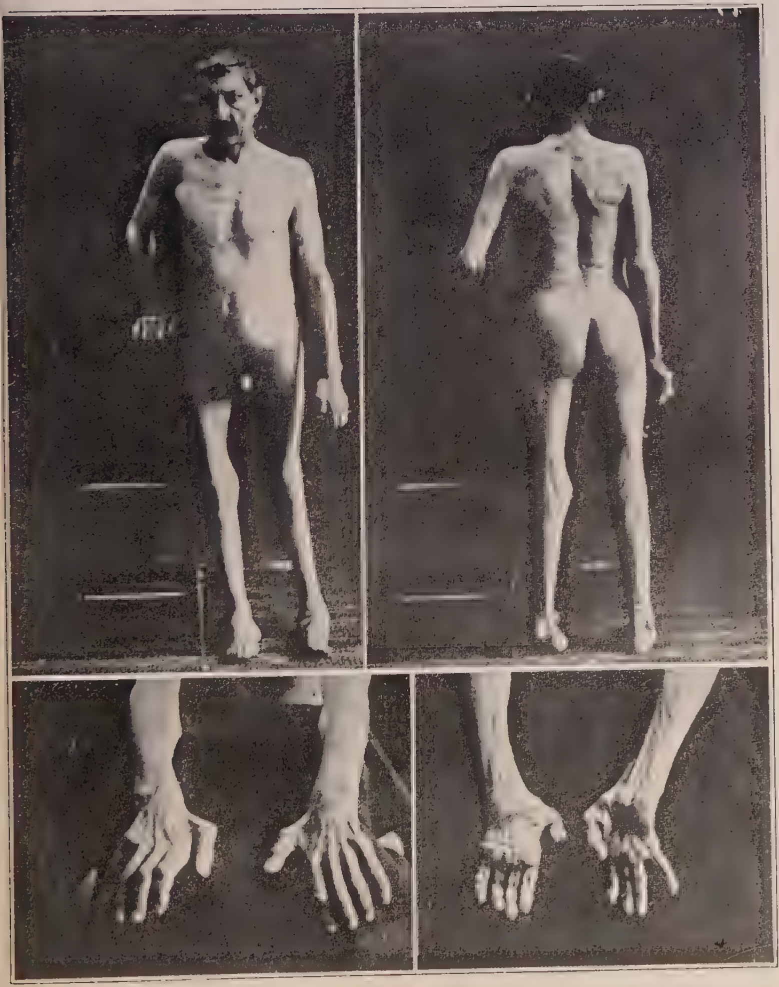
(8) Jour. Nerv. and Ment. Dis., 1908, Vol. 36, p. 269.
(9) Jour. Am. Med. Ass'n., 1911, Vol. 57, p. 1117.
(1) Ibid., 1913, Vol. 61, p. 1959.
(2) Rev. of Neurol. and Psych., 1911, Vol. 9, p. 169.
(3) Deutsche Zeitschr. f. Nervenh., 1913, Vol. 46, p. 436.
436.
(4) Ibid., 1914, Vol. 53, p. 114.

PLATE XIII.



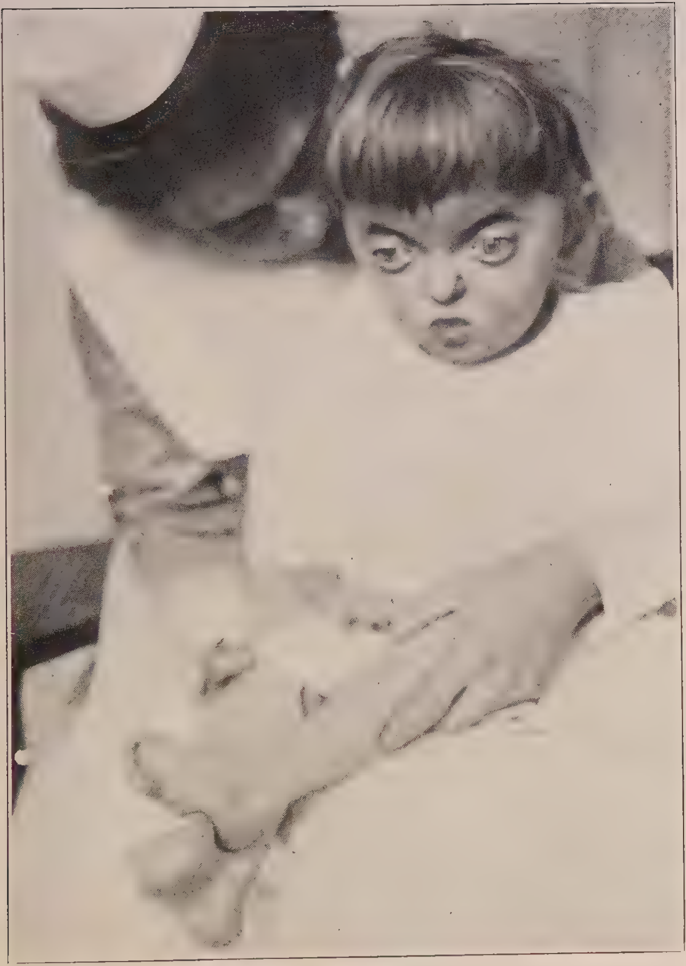
Charcot-Marie type of muscular atrophy, Case 1.—Souques (see page 158).

PLATE XIV.



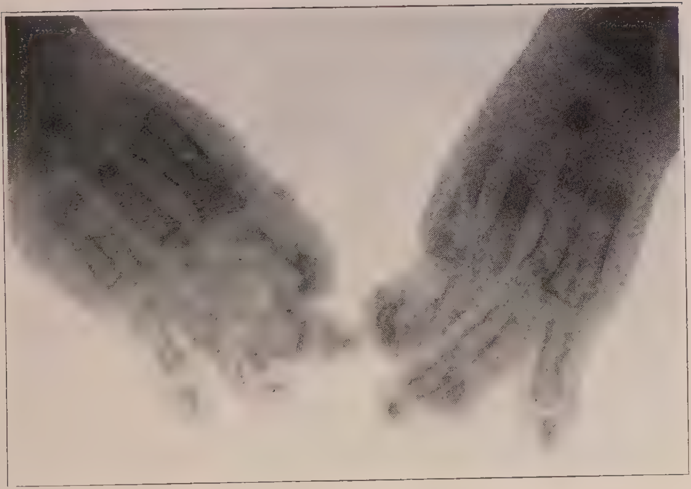
Charcot-Marie type of muscular atrophy. Case 2.—Souques (see page 158).

PLATE XV.

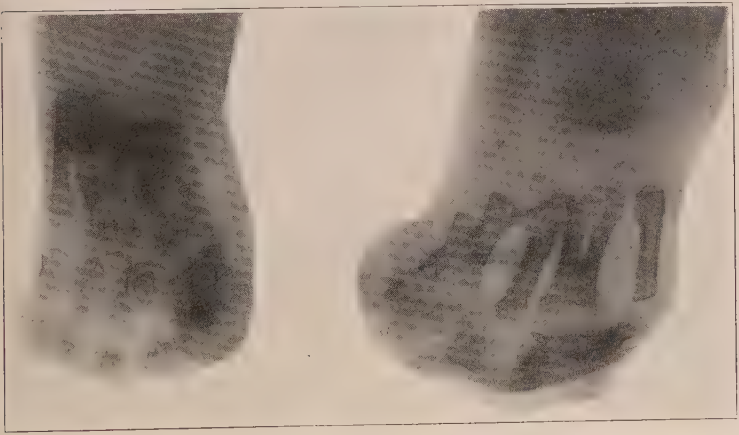


Patient with acrocephalosyndactylism.—Davis (see page 165).

PLATE XVI.



Roentgenogram of hands.



Roentgenogram of feet.

Acrocephalosyndactylism.—Davis (see page 165).

myotonic disturbance was present in both hands, the opening and shutting of which was difficult on account of the stiffness and slow relaxation. There was also some stiffness in the movements of the tongue. The muscles of the hands and the extensors of the forearm showed distinctly increased mechanical irritability, as they would remain contracted after being tapped with a percussion hammer. The characteristic myotonic electric reaction was present in the supinator longus and the small hand muscles, as well as in the tongue and some of the facial muscles. The gait was distinctly ataxic and the muscles of the lower extremities were slightly hypotonic. All tendon reflexes were absent, while the abdominal, cremasteric, and plantar reflexes were normal. The pain sense appeared diminished everywhere, while other cutaneous sensation was normal. The pupils reacted normally. The patient was of a low grade of intelligence and inactive. The father is also said to have shown pronounced unsteadiness and a speech disturbance in addition to the myotonic condition of the hands. Both this patient and another similarly affected were subjected to the pharmacologic tests for vagotonia and sympathicotonia described by Eppinger and Hess with negative results.

Another case, with a family history of cataract but no history of familial myopathy and no myotonic manifestations, is reported by E. G. Fearnsides,[5] who prefaces it with the remark that judging by the recorded cases the distribution of muscular wasting has conformed more nearly to classical descriptions in myotonia atrophica than in any of the other forms of myopathy, and at the same time the myotonic manifestations, which have given the name to this sub-group of the myopathies, have been most variable.

The patient is a woman of 41 years, whose family history is interesting as it shows consanguinity and cataract but no other cases of myopathy. At 31 she developed cataract of both eyes, a year later her neck became weak, and four years later difficulty in walking set in. When first seen by the author there was marked

---

(5) Rev. of Neurol. and Psych., 1915, Vol. 13, p. 311.

wasting of the trapezii and sternomastoids and of all the deep muscles at the back of the neck. All the muscles of the upper extremities were poorly developed but their tone was normal. The gluteal muscles were definitely atrophic and weak, as was the left quadriceps. The anterior tibial muscles were markedly affected. No fibrillary twitchings or myotonic symptoms were ever observed. Her face is described as thin, angular, and flat, but with movements of full range. According to the author, the only unusual feature in the distribution of the atrophy is the marked involvement of the deep muscles of the neck.

Clinical Study of Paralysis Agitans. Ernst Trömner[6] has studied 40 cases of this disease, 18 in men and 22 in women. Most authors find the disease preponderating in men; for instance, Gowers in the proportion of 5 to 3. The average age at the onset was 59 years. Of "juvenile" cases the author had one with onset at the age of 23 years. The patient was a woman, who at that age discovered a tremor in the left hand shortly after an attack of facial erysipelas. Successively the right hand and the feet became involved and the usual rigidity gradually set in. When seen at the age of 49 years she had the typical stooping attitude, weepy, immobile face, constant tremor of the hands when at rest, with momentary suppression of the tremor on any voluntary movement. In every way this is a typical case of paralysis agitans, but one unusual feature was present, namely, a typical bilateral Babinski sign. Although such authorities as Oppenheim and Mendel consider the presence of this sign as evidence of an organic complication, a view previously shared by Trömner himself, he is now convinced that the pathologic process in uncomplicated paralysis agitans may, rarely, produce the conditions necessary for the appearance of this sign. The author quotes Willige's statement that in the entire literature from 1850 to 1910 he found only 14 certain cases with onset before the age of 30. [The age factor in paralysis agitans was discussed in the Practical Medicine Series, 1914, Vol. 10, p. 142.] As in other neuroses and psy-

---

(6) Deutsche Zeitschr. f. Nervenh., 1915, Vol. 53, p. 38.

choses appearing at an unusually early stage, heredity plays a greater rôle than it does in cases with the usual late onset. The disease frequently sets in after worry or excitement, especially in connection with financial losses or grief over family affairs. Brissaud observed the symptoms appear 48 hours after a severe fright and Erb considered severe depressive emotion as exciting cause in 19 cases out of 30, Mendel in 19 out of 41 cases. Trömner never found trauma a factor, which was claimed to be the case in 7 out of 35 cases observed by Ruhemann. On the other hand he confirms the view of Krafft-Ebing as to the importance of physical overwork. Onset after some particularly great physical effort is not uncommon. However, the rôle of chronic muscular fatigue can not be important, otherwise the onset would be more frequently in the right arm than is actually the case. While Erb found the right arm more frequently first involved in the proportion of 77 right to 60 left, Mendel found the onset equally frequent in the right and left hand and the present author 22 times in the left arm and 15 times in the right arm. He corroborates Mendel in the statement that symptoms of neurasthenic type may precede the onset of recognizable symptoms of paralysis agitans by several years. As true neurasthenia rarely begins in the fifties the appearance of such symptoms at this age should lead us to think of paralysis agitans. Especially frequent prodromata of this class are such symptoms as dizziness, disturbed sleep, palpitation, feeling of pressure in one hand, unexplainable general weakness and a general shaky feeling. While the tremor usually is most marked with the hands at rest, 4 of the author's 40 patients had the opposite type of tremor, namely, intention tremor. The tremor often remains unilateral throughout and always begins on one side, which feature serves to distinguish Parkinsonian from senile tremor. The tremor is usually confined to muscles concerned in voluntary movements while the other important symptom, the rigidity, chiefly affects symmetrically the muscles of the neck and trunk which are concerned in maintaining equilibrium.

The question of the existence of a characteristic Parkinsonian insanity is discussed. Three types have been described: (1) Emotional instability either of depressed or exalted type, (2) hypochondriacal paranoid psychosis, and (3) light grade mental weakness. The second type was exhibited by one of Trömner's patients and he considers this type the one most worthy of being considered in any sense specific.

The author concludes by stating that the psychoses mentioned are the final links in a great chain of symptoms which have widened the conception of this disease far beyond the motor affection first described by Parkinson and have led to a wider conception of a polysymptomatic neurosis, the foundation of which undoubtedly must be sought in a disease of the entire nervous system but with the greatest involvement in the conducting paths and the grey matter of the brain stem. At least the motor phenomena seem to be dependent on degenerations in the lenticular nucleus. The author rejects the claims hitherto made for the parathyroid hypothesis.

Cervical Rib Causing Thrombosis of the Subclavian Artery. Dejerine and Mouzon[7] presented a case in which a cervical rib produced ischemia of the extremity by compression of the subclavian artery and subsequent thrombosis. The patient was a woman 28 years old who had suffered from pain and numbness in the left hand. The fingers were white and extremely tender and signs of impending gangrene began to appear. Symptoms of ischemic paralysis, severe attacks of itching, and transient urticaria lesions were present. The condition of the artery was discovered at operation, which consisted in the resection of the rib. Only partial relief had been obtained at the time the case was reported, the symptoms being due to the arterial thrombosis and not directly to pressure by the rib.

A New Case of Loss of Pupillary Light Reflex From Alcoholism. In the Practical Medicine Series, 1912, Vol. 10, p. 156, we reviewed at some length the important observations of Nonne, which seemed to prove that the Argyll-Robertson pupil does not always mean syphilis but in rare instances may be produced by alcoholism.

---

(7) Rev. Neurol., March, 1915, p. 220.

Since then a similar case in a chronic drinker with alcoholic epilepsy and alcoholic neuritis has been reported by Mees.[8] Recently Nonne[9] reports a new case in a woman 43 years old, who had been a steady and heavy drinker for 15 years. She came to the hospital on account of delirium tremens. The pupils reacted promptly in convergence but not at all to light. The patient was under observation for 6 months. Lumbar puncture was made three times and the fluid showed negative Wassermann and globulin tests. The blood also gave negative Wassermann test. There was no history nor clinical evidence of syphilis in the patient or her husband. The latter also gave a negative Wassermann test. The patient was also carefully examined by Professor Wilbrand, who found no evidence of optic nerve disease to account for the loss of light reflex. The pupillary condition remained unchanged for four months. In the beginning of the fifth month the right pupil reacted slightly to light and three weeks later the left one began to react to strong light. [In Nonne's previous paper, referred to above, he mentions a case of delirium tremens in which the reaction to light returned two weeks after the cessation of the delirium.—Ed.]

Acrocephalosyndactylism. This unusual teratologic type was briefly referred to in the Practical Medicine Series, 1914, Vol. 10, p. 149. This year Benjamin F. Davis[1] presents a profusely illustrated report of a case in a girl 3½ years old. The child was born at term and the labor was normal. At the age of 3 weeks she had the first of a series of five unsuccessful operations for the separation of the fingers. She walked at the age of 26 months. She is fairly bright but not up to the normal standard of her age. The peculiar deformity of the head and the exophthalmos are seen in Plate XV.

"In general the head is relatively short in the sagittal diameters and greatly lengthened in the fronto-mental, bitemporal and bizygomatic diameters. The shape is roughly that of a four sided pyramid; the apex in the

---

(8) Münch. Med. Wochenschr., 1913, No. 12.
(9) Neurol. Centralbl., Apr. 15, 1915, Vol. 34, p. 254.
(1) Am. Jour. Dis. of Children, May, 1915, Vol. 9, p. 446.

neighborhood of the lambda is rather bluntly rounded, dome-like; the base is represented by the face which is somewhat diamond shaped, the angles being at the chin, middle of zygomatic arches, and the most prominent point on the smoothly rounded, rather bulging, open frontal suture. The face is flat and broad; the forehead high and precipitous, gently rounding laterally into the temporal areas which slope outward and downward toward the prominent zygomatic arches. The superciliary ridges are highly arched and flattened. The roof of the orbit may be palpated for about 2 cm. posteriorly from its anterior border. There is marked proptosis. The eyeballs appear to be placed low in the orbits because of the excessive arch and flattening of the supraorbital ridges. The bridge of the nose is low but the end bulges quite markedly. The lips and tongue are normal. There are ten fairly well formed, but somewhat irregularly placed teeth in each jaw. The canines are not excessively prominent. The hard palate has an extremely high arch, the sides coming together at an angle rather than at an arch at the highest point, which is located very close to the junction with the soft palate.''

X-ray examination of the skull: The lambdoid and coronal sutures are closed, the sagittal suture between the nasion and anterior fontanelle is enormously dilated; posterior to the fontanelle it is closed. The sella turcica is markedly deepened and broadened.

Ophthalmoscopic examination by Dr. C. G. Darling: Media clear; nerve head grey and marginal disc blurred; apparently some swelling of disc (edema); retinal vessels slightly tortuous.

The appearance of the hands and feet is shown in Plate XVI.

This condition was first described in detail by Apert in 1906 and in 1914 Sterling[2] reviewed the 9 cases available at that time.

''The etiology of acrocephalosyndactylism is unknown. There is nothing of a familial or hereditary character in connection with the condition. In some cases syphilis

---

(2) Zeitschr. f. d. ges. Neurol. u. Psych., 1914, Referate Vol. 9, p. 38.

appears in the history. In others hydramnios was noted during pregnancy, but neither is of constant occurrence. The deformity of the skull is probably the result of the early closure of the sutures at the base and posteriorly. The syndactylism may be due to amniotic adhesions as has been suggested by Wheaton; it has been suggested that there may be a trophic correlation between the faulty development at the base of the brain and that of the extremities. The condition does not necessarily shorten life, and the intelligence of the patient may not be seriously impaired. The age of the oldest patient described was 21 years. The youngest patients were infants of a few months. No roentgen-ray studies have been reported."

Another Recent Contribution to the Subject of Acrocephalosyndactylism is one by B. Gadelius[3] in which not less than four new and typical cases are reported. The abundant illustrations show the marked resemblance to the one just related and to those previously reported by Apert and others.

Case 1. Male, 24 years; illegitimate child; mother was nervous, with much vasomotor irritability. The patient was an inmate of an institution for the feeble-minded and showed the characteristic high head, flattened anterio-posteriorly, the exophthalmos, fused fingers and toes, irregularly placed teeth and high palate.

Case 2. Female; eleventh child; died at 8 years of tuberculosis. The mentality was only slightly impaired. All characteristic deformities.

Case 3. Male; died of pneumonia at 8 years. Little mental impairment. All typical deformities. No change in sella turcica or hypophysis.

Case 4. Female, 25 years. Mild imbecile. Has all the typical deformities.

All previously reported cases are analyzed. It is noteworthy that there never has been more than one case in one family, especially as most bony anomalies have a familial tendency. This is even true of syndactylism when occurring by itself or together with polydactylism. The peculiar combination of defects of the clavicles and

---

(3) Nordiskt Med. Arkiv., 1915, Afd. II. Häft I. M. 5.

deformities of the head known as "dysostosis cleidocranialis" is also familial, as is the "dystrophia periostalis hyperplastica" of Dzierzynsky,[4] characterized by a peculiar oxy- or acrocephaly, and thickening and shortening of the phalanges.

To explain the combination of deformities in acrocephalosyndactylism Babes assumes the existence of a common trophic center for the skull and extremities and Apert has directed attention to the hypophysis. However, no proof has been forthcoming as yet.

---

(4) Zeitschr. f. d. ges. Neurol. u. Psych., Vol. 20.

MENTAL DISEASES.

GENERAL CONSIDERATIONS.

The Need of Psychologic Training for Physicians. This subject was discussed in the Practical Medicine Series, 1912, Vol. 10, p. 205, and 1914, Vol. 10, p. 151, with especial reference to the planning of suitable courses in medical schools. The following concluding remarks in a recent paper by Adolf Meyer[1] contain much food for reflection:

"To sum up: From time immemorial the physician has been urged to treat not only the diseased organs or the condition, but also the patient. And of late years we have learned to realize that indeed some disorders can be explained and treated, as abnormal and unhealthy ways of the person rather than as disorders of any one special organ; rather as disorders of the combination and its behavior. Every medical teacher gives some advice on this topic of doing justice to the personality; oftenest, and probably too often, he feels that the talent for dealing with personality must be inborn and cannot be hammered in by any training.

"Of late years the difficulties in the total unified adjustment and behavior of our patients have been more and more reduced to intelligible processes: defects of development, intellectual, affective, or conative, improper use of the assets, etc. Instead of mere vague ideas of something requiring special handling, we have today a growing body of facts in the way of habit disorders, harmful substitutions and the like which must be heeded in helping the patient to reach his best ground. How can the student be helped to command these facts most

---

(1) Jour. Am. Med. Ass'n., Sept. 4, 1915, Vol. 65, p. 860.

quickly? We teach him physics and chemistry and biology and physiology. Who teaches him the elements of these reactions which we call behavior and mentation? He enters on this field with confused and confusing notions; how is he to straighten them out?

"The first condition for productive work in this field of psychobiology as in any other, certainly, is controlled procedure and methods of description and record and experimentation which come up to definite standards. It is clear that psychobiology and psychopathology have principles to offer which go beyond the dilettante realm and form a fairly clean-cut body of methods and helpful procedures: not only safe neurologic methods and safer methods of work with internal secretions as such, but also safer methods of inducing and directing associative and nonassociative processes and associative material serving the best demands of the various types of make-up.

"The difference between modern psychology and the older form is that we can no longer be satisfied with mere plausible statements and amplifications of the obvious, but must test and verify objective facts under controlled conditions and controlled modifications.

"In my own teaching, I am determined not to put curiosities and the sensational to the forefront. Students whose interest goes toward such sensational things can in time be reached even with this conservative scheme if they have the right stuff in them. On the other hand, stagy psychology can be maintained to advantage by but few teachers and few workers and it fails with the bulk of our clinical method. We must discourage the ever-lurking interest in the occult and semioccult and replace it by solid confidence in reliable methods and by determined interest in matters obviously calling for serious objective study.

"This hasty survey might easily gain by further amplification. I trust it may give an idea of the entire practicability of a course of study of objective behavior and mentation useful and essential to every student and physician; likely to give a sane balance and to furnish protection against extreme and one-sided vagaries or equally unnecessary psychophobia, which have so long marred the efforts of physicians in their working with the personality of the patient as well as with the individual organs. Saner views will make us physicians juster and more capable and less likely to drive a lot of sensible but misguided people into obscure mystical cults and ourselves into passing fads and fashions, and empty squabbling before a justly distrustful public, and they also will make unnecessary that new profession of "clinical psychologist" and efficiency psychologist for which a medical training will become obligatory if we physicians show the sense and capacity to furnish the needed psychobiology as a necessary and obligatory part of our training."

Types of Personality Associated with the Occurrence of Different Types of Mental Disorder. H. Douglas Singer and S. N. Clark[2] have made an interesting application of the statistical method by tabulating data regarding the personal make-up of victims of various psychoses as obtained from their relatives and friends. The adjectives selected are those most frequently used by those giving the information. The following table

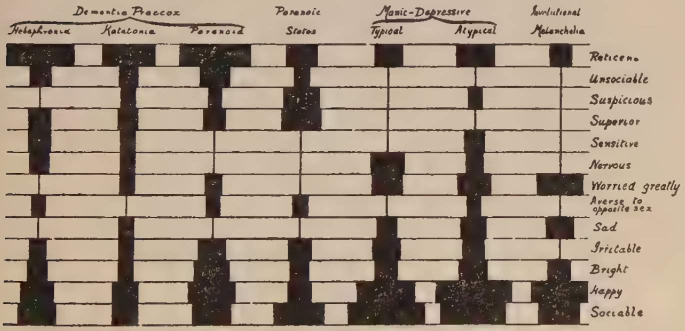


Fig. 3.

---

[2] Biennial Report of State Psychopathic Institute, at Kankakee, Ill., Oct. 1, 1914.

gives the data, arranged in frequency for each type of disorder. Those adjectives are included which were used in at least ten per cent. of the cases.

Dementia praecox							
Hebephrenic 50 cases	Per cent.	Katatonic 36 cases	Per cent.	Paranoid 50 cases	Per cent.	Paranoic states 35 cases	Per cent.
Reticent	46	Reticent	39	Reticent	52	Sociable	37
Sociable	28	Happy	19	Happy	34	Superior	29
Happy	24	Sociable	19	Worked hard	32	Suspicious	26
Worked hard	20	Worked hard	19	Sociable	28	Worked hard	26
Sensitive	16	Superior	14	Bright	26	Reticent	23
Superior	16	Unsociable	14	Unsociable	22	Happy	17
Unsociable	16	Bright	11	Irritable	20	Irritable	17
Bright	14	Irritable	11	Superior	16	Bright	14
Nervous	14	Nervous	11	Worried	12	Averse to opp. sex	11
Spoiled	14	Sad	11	Averse to opp. sex	10	Conscientious	11
Ambitious	12	Sensitive	11	Suspicious	10	Unsociable	11
Irritable	12	Suspicious	11				
Averse to opp. sex	10	Worried	11				

Manic-depressive reactions					
Typical 50 cases	Per cent.	Atypical 50 cases	Per cent.	Involutional melancholia 35 cases	Per cent.
Sociable	56	Happy	56		
Happy	42	Sociable	48	Happy	42
Worked hard	36	Reticent	28	Worked hard	33
Nervous	24	Worked hard	28	Worried	33
Worried	22	Worried	24	Sociable	31
Irritable	20	Bright	20	Sad	20
Reticent	20	Sad	18	Bright	16
Bright	16	Irritable	16	Reticent	16
Sad	14	Sensitive	14		
Excitable	10	Nervous	12		
Quick tempered, quick recovery	10	Averse to opp. sex	10		
		Suspicious	10		

The authors devised an ingenious way of representing the most striking results of this compilation in graphic form as seen in Fig. 3.

The authors tell us that "this investigation is regarded only in the light of a preliminary survey to prepare the way for outlining more suitable methods of study which are now being followed. Yet one cannot but be struck by the fact that, taken broadly, the traits of character and disposition here collected from the history of patients before the outbreak of the psychosis bear a very strong resemblance to the characteristic features of the pictures presented in the different types of mental disorder which finally developed. The marked inaccessibility and reticence so characteristic of the developed dementia praecox picture are here foreshadowed by the 'shut-in' personality peculiar to these individuals before the outbreak of what is called the 'attack of insanity.' The suspiciousness and egotism of the paranoic development and the oddities of the mixed and atypical forms of manic-depressive reaction are apparently also present even before the insanity develops.

"These points and the relation of the individual make-up to the type of mental disorder must be studied with individuals as well as with groups and the whole needs to be co-ordinated with a study of precipitating factors."

Reform of Expert Testimony and Provision for Hospital Observation of the Alleged Insane in Criminal Cases. Psychiatrists, judges, lawyers and intelligent persons in general are more and more recognizing the need of greater efficiency in methods of determining the mental state of persons accused of crimes than the present one of hit-or-miss *ex parte* expert testimony. In the Practical Medicine Series, 1910, Vol. X, p. 210, we quoted the recommendations made by a committee of the American Medico-Psychological Association emphasizing the need of hospital observation in certain cases and measures for greater freedom and impartiality of medical testimony. Since then the matter has been further elaborated both by medical and legal bodies with the view of securing uniform legislation in the several states. A bill to cover the essential and most urgent reforms has been prepared by a committee of the American Institute of Criminal Law and Criminology and was unanimously endorsed by this body as well as by the Committee on Expert Testimony of the Council on Health and Public Instruction of the American Medical Association. The committee which prepared the bill consisted of E. R. Keedy, professor of law in Northwestern University, Judge Albert C. Barnes of Chicago, Dean W. E. Mikell of the University of Pennsylvania Law School, and Drs. Adolf Meyer, Harold N. Moyer, W. A. White and Morton Prince. The bill is as follows:

SECTION 1.—*Summoning of Witnesses by Court.* Where the existence of mental disease or derangement on the part of any person becomes an issue in the trial of a case, the judge of the trial court may summon one or more disinterested qualified experts, not exceeding three, to testify at the trial. In case the judge shall issue the summons before the trial is begun, he shall notify counsel for both parties of the witnesses so summoned. Upon the trial of the case, the witnesses summoned by the court may be cross-examined by counsel for both parties in the case. Such summoning of witnesses by the court shall not preclude either party from using other expert witnesses at the trial.

SECTION 2.—*Examination of Accused by State's Witness.* In criminal cases, no testimony regarding the mental condition of the accused shall be received from witnesses summoned by the accused until the expert witnesses summoned by the prosecution have been given an opportunity to examine the accused.

SECTION 3.—*Commitment to Hospital for Observation.* Whenever in the trial of a criminal case the existence of mental disease on the part of the accused, either at the time of the trial or at the time of the commission of the alleged wrongful act, becomes an issue in the case, the judge of the court before which the accused is to be tried or is being tried shall commit the accused to the State Hospital for the Insane, to be detained there for purposes of observation until further order of court. The court shall direct the superintendent of the hospital to permit all the expert witnesses summoned in the case to have free access to the accused for purposes of observation. The court may also direct the chief physician of the hospital to prepare a report regarding the mental condition of the accused. This report may be introduced in evidence at the trial under the oath of said chief physician, who may be cross-examined regarding the report by counsel for both sides.

SECTION 4.—*Written Report by Witness.* Each expert witness may prepare a written report upon the mental condition of the person in question, and such report may be read by the witness at the trial. If the witness presenting the report was called by one of the opposing parties, he may be cross-examined regarding his report by counsel for the other party. If the witness was summoned by the court he may be cross-examined regarding his report by counsel for both parties.

SECTION 5.—*Consultation of Witnesses.* Where expert witnesses have examined the person whose mental condition is an element in the case, they may consult before testifying, with or without the direction of the court, and may prepare a joint report to be introduced at the trial.

The committee makes the following comment on the proposed hospital commitment and written report features:

Section 3, which is applicable to criminal cases only, does not present a new idea. Maine, New Hampshire, Massachusetts and Vermont have statutes providing for the commitment of a defendant, who is relying upon mental disease as a defense, to a hospital for purposes of observation. According to the language of the Maine and Vermont statutes, the report of the superintendent is final on the question of the defendant's condition, for they provide that the accused shall be detained and observed "that the truth or falsity of the plea (of insanity) may be ascertained." The Virginia legislature at its last session (1914), enacted a statute providing that the trial judge may commit an accused person to a hospital for purposes of observation. The statute also empowers the judge to appoint qualified experts to examine the accused before this commitment and to report the results of their examination to the judge. The establishment in large cities of psychopathic institutes, such as the one recently started in Chicago in connection with the Municipal Court, would facilitate greatly the examination and study of persons mentally diseased or deficient.

Section 4, which covers civil and criminal cases, will enable the expert witness to present a much more accurate and connected description of the defendant's mental condition, particularly with reference to the symptoms of his disease. Under the present system, by which the opinion of the witness must be drawn out by a series of questions put up by counsel, witnesses often feel that they are unable to present an adequate diagnosis of defendant's condition, and to express a full and convincing opinion regarding his powers of judgment and decision. Such a plan as is proposed in section 4 has worked successfully in Scotland. The medical witness in a Scottish criminal trial, after an examination of the defendant, prepares a written report which he files with the clerk of the court. At the trial, after the witness has been sworn and has qualified as an expert, he reads his report to the jury. The counsel for the party which has called the witness may ask any explanatory questions, and the witness is then cross-examined by the counsel for the other side.

Henry R. Stedman(3) discusses the operation of the Massachusetts laws for hospital observation in cases of alleged mental disease and defect.

"There can be no question that an opportunity for hospital examination in obscure cases, where the subject can be under day and night supervision, can be examined by a staff of resident physicians and must live under the eyes of nurses trained to observe and report the talk, conduct, peculiarities and habits of patients, should be of the greatest help in reaching prompt and accurate decisions. Such a proceeding would also save expense to the state and make retrials less frequent. Moreover, where the law requires that in all criminal cases in which the plea of insanity is raised, the person shall be subjected to a period of hospital observation, as in the state of Maine, it undoubtedly tends to lessen the number of cases in which insanity is resorted to as a defense. Still further, the evidence of unprejudiced state medical officials is likely to have far more weight with juries than that of paid medical experts engaged with a view to *ex parte* testimony.

"The classes of criminals most likely to be affected by such a law are, first, those who conceal their delusions. These persons are notoriously suspicious, and persistently refrain from unburdening themselves to the examiners, so that many long interviews may be needed to gain their confidence sufficiently to elicit their false beliefs. Persistent feigning can also be far more easily and quickly detected under hospital conditions and surroundings than in jail, owing chiefly to the difficulty which a prisoner experiences in keeping up the pretense of insanity uninterruptedly and consistently (as he must to be successful) where he is watched day and night by careful observers. Most malingering is, as all know, bungling and readily exposed; but it is only with the utmost difficulty that really adroit feigning can be detected by the expert in occasional visits to the jail. Others are notorious capital cases. Here hospital observation as an adjunct to expert examinations must be of advantage in silencing popular clamor lest the prisoner escape just punishment through what is termed the 'insanity dodge.'

---

(3) Jour. Am. Med. Ass'n., 1915, Vol. 65, p. 618.

"The number of criminal cases affected by this law in Massachusetts is, to be sure, not large. In the past five years but thirty-two were admitted to the Bridgewater State Hospital (for criminals), and a much smaller number to the other hospitals. One reason for this is thought to be that frequently the mental condition of accused persons under complaint or indictment has not been recognized until after imprisonment, when they are regularly committed as insane and transferred to Bridgewater from penal institutions. The law, however, is being more generally availed of year by year in the lower courts for the not infrequent borderland and other cases in which mental disease or defect is suspected in persons under arrest. But though the number of such cases is small, they bulk largely in public importance, as they embrace many capital cases, and it is in them that hospital observation is of especial value."

Out-Patient and "After Care" Work in Connection with State Hospitals for the Insane. Several years ago the function of state hospitals for the insane was considered to be chiefly custodial. Then it was realized that facilities for modern treatment as carried out in our best general hospitals had to be provided, and this has now largely been accomplished; so these institutions properly are designated hospitals and no longer asylums. A further expansion of the greatest practical importance is now being attempted at several of the most progressive institutions by the establishment of out-patient departments and by measures for keeping under observation and guidance patients discharged from the hospitals. It is natural that this movement is most advanced in the state where social service work was first demonstrated to be useful and practicable, namely, Massachusetts. An account of this work is given by L. Vernon Briggs and A. Warren Stearns[4] of the Massachusetts State Board of Insanity. The school for the feeble minded has already had an out-patient clinic for 25 years and the Psychopathic Hospital in Boston has had an out-patient department since it was opened in 1912. In establishing a policy which would affect all the institutions for the insane and feeble minded it was the intention of the board to stimulate each hospital to "reach out," as Dr. Adolf Meyer once said, "into the community and be responsible for the mental health of the community or district which it covers." It was decided that out-patient clinics should be conducted by the physicians of the state hospitals in the large cities of their districts, preferably in the evening.

"Some hospitals already had after-care or social service workers. All hospitals were urged to take on such workers, who should be present at each clinic. It was hoped that the out-patient departments would eventually cover the work of the clinics, the after-care or social-service work, mental hygiene and boarding out. It was also hoped to stimulate the discharge of cases earlier than had before been possible, for many suitable patients could safely be sent out if clinics were established in or near the town or city where they resided. The after-care or social worker would be glad to get in touch with new cases who first came to the clinics, would see the discharged cases or look them up if they did not report, and often be able to interview members of the families of patients in the hospitals who could not conveniently come to the hospitals.

"The board believed that the out-patient department would be the first important step for the prevention of mental disease in this state, and that the supervision and after-care of patients would prevent the return of

---

(4) Am. Jour. Insan., 1915, Vol. 72, p. 35.

many who had been discharged. Out-patient departments are not alone for medication and treatment, but also for education and for the interpretation of the functions of the great state hospitals. A comparison may well be made here with the public health center idea. Formerly the responsibility for the supervision of the boarded-out patients had been centralized in the State Board of Insanity. The board began in August, 1914, to decentralize their supervision, placing the patients in their own districts under the immediate care of the hospitals, each hospital assuming the responsibility for the patients in its district.

"The social-service worker is proving an important factor in the thoughtful discharge of patients; for example, in one of our state hospitals a patient under consideration for discharge is held until a report has been received from the social-service worker of the home conditions or environment into which the patient must return. In other words, the medical and social elements are considered in every discharge.

"The problem of the feeble minded has had special attention by the opening of clinics in different parts of the state. The attendance at these clinics of patients and physicians seeking advice has been so great that the staff physicians have been obliged to turn some away, owing to the length of the clinic and the mental fatigue of the examining physicians.

"Another extension of the hospital work is the wide public coöperation effected by meetings of medical societies held in the hospitals, and talks on modern care and treatment of the insane and the relation of the state hospitals to the public by members of the hospital staffs at medical and other public meetings outside of the hospitals.

"An interesting development has been the service rendered private physicians who have sought advice of the out-patient staff for their own patients. One illustration will indicate the enthusiasm with which the movement has been received: After a hospital in the western part of the state had opened clinics in two cities in its district, the physicians of a third and important city petitioned the superintendent of the hospital to open a clinic in their city, and this was promptly done.

"The hospitals are open to the public and may be visited daily, including Sunday.

"At the end of seven months we can say that the out-patient department has proved a success and has met the fondest hopes of the board.

"The number of physicians who attend these clinics is surprising; in some of the early clinics they outnumbered the patients. They are invited to bring their patients to the clinics, to consult with the physicians on duty at the clinics regarding patients they may have, with the hope of so caring for them as to prevent institutional treatment if possible. The hospitals, medical societies and other organizations have gladly given space for the clinics free of charge, and the expense so far has been a negligible amount.

Sex Organ Changes in Insanity. This subject is well elucidated by the following editorial which appeared in the Journal of the American Medical Association,[5] which mentions some of the most recent contributions on the subject:

"Recent histologic examination of the testicles in insane males, and of the ovaries in demented females, has demonstrated that Nature tends to limit reproduction in those who are mentally unsound. Degenerative changes and atrophy of these organs are so pronounced in some of the severe psychoses as to make procreation impossible.

"Todde compared the volume and weight of testicles from insane patients with those of individuals dying from accident or usual illnesses. He found that the testes of the insane were notably smaller, and that altered structure and function were present in the various groups of mental disease, and seemed, for the most part, independent of the age. The most constant and distinct lesions were found in the testicles of idiots and imbeciles, in which, not infrequently, absolute arrest in the development of these organs had occurred. In other instances, degenerative changes were present in the spermatoform

---

(5) July 17, 1915, Vol. 65, p. 254.

interstitial structures of both the epididymis and seminiferal canals. There was also a marked increase in the intercanalicular tissue.

"In contrast to these findings are the changes which occurred in dementia praecox. Here a great variation was found. In some cases there was an alteration of the 'filial' cells and therefore a diminution of function. More often, however, there was a degeneration of the cells which have to do with the production of spermatozoa, or an atrophy of the seminiferous tubules with an accompanying increase in the intertubular connective tissue. In these cases there was an absence of spermatozoa. In senile dementia, irrespective of the patient's age, function was frequently abolished and there was an atrophy of the testicles. In other cases, there was evidence of marked diminution of function. This was also found in dementia paralytica, manic-depressive insanity, and in the so-called secondary dementias. In the psychoses attendant on the late stages of pellagra, evidences of hypofunction were present, which were directly proportional to the length and severity of the mental derangement. As one would expect, the forms of insanity of alcoholic origin have least effect on the genital organs. Nevertheless, a diminution of glandular activity usually occurs.

"After a study of serial sections of ovaries from one hundred women who suffered during life with some form of mental disease and who died before reaching the menopause, Laura Forster came to similar conclusions. She found that in mental disease there was either a lessening or a complete loss of ability to reproduce. This was especially true in dementia praecox, in which, at the age of thirty years, there was marked evidence of involution of the ovaries with an interstitial connective tissue increase and a smaller number of Graafian follicles. Thus, there seems to be no relation between the changes in the sexual organs of the insane and the age of the patients. The degenerative processes are apparently in direct proportion to the duration and gravity of the mental disease.

"It is of interest in this connection to recall the work of Fauser and others who found, by using the Abderhalden method, that there are circulating in the blood, in dementia praecox and other mental disturbances, enzymes which are specific for testicular protein in the male and ovarian proteins in the female.''

The Abderhalden Reactions in Cases of Insanity. In previous volumes of this series we have traced the progress of the efforts to make practical use of these delicate reactions in cases of mental disease. Last year we noted that the concensus of opinion was that these tests are not ripe for such application. F. Sioli[6] again sifts the entire literature and reports his own work. He concludes that on account of the many sources of error the method is not yet practically helpful in psychiatry, but that it is of theoretical interest and has sufficient basis to warrant further efforts toward its perfection. He admits that all investigators find different types of reaction in manic-depressive insanity as compared with other psychoses but warns against utilizing them in diagnosis or prognosis.

L. Dimitz and E. Fries,[7] assistants in the large psychiatric clinic of Wagner von Jauregg in Vienna, express themselves in similar manner regarding dementia praecox as well as other psychoses, though attaching some importance to the frequent reactions against the sex glands in this disease. The results so far, according to them, do not permit of the utilization of the Abderhalden tests in the practical diagnosis between dementia praecox and the so-called functional psychoses.

Combined Psychoses. John E. Lind[8] states that only here and there in the standard works on psychiatry are found allusions to the possibility of the existence of combinations of psychoses, and a review of the literature for the past 30 years reveals a scant 27 articles bearing on the subject. However, it seems to be the opinion of psychiatrists that combined psychoses are fairly frequent, far more so than would appear by the published reports of such instances. Of previous reports may be mentioned one of undoubted Korsakoff's polyneuritic

---

(6) Arch. f. Psychiat., 1914, Vol. 55, p. 241.
(7) Wien. med. Wochenschr., 1914, Vol. 64, p. 2292.
(8) Jour. Nerv. & Ment. Dis., 1915, Vol. 42, p. 217.

psychosis coexisting with the depressed phase of manic-depressive insanity. (J. W. Stevens[9]). Kraft-Ebing speaks of general paresis developing in paranoics. In 1911 Karpas and Poule presented a case of dementia praecox and tabes to the New York Neurological Society for differential diagnosis from general paresis with tabes. W. F. Lorenz[1] reported a case of manic-depressive insanity, infection with syphilis and subsequent development of paretic dementia. According to Lind the most noteworthy clinical report is one by George W. Gorrill,[2] who contributes five cases:

1. Dementia praecox of 33 years' duration, infection with syphilis at 51 years of age, followed in 6 years by paretic dementia.
2. Paretic dementia developing at the age of 44 in a woman who had had two attacks of manic-depressive type, one at 33 and one at 41.
3. Manic-depressive insanity with three attacks at 19, 22 and 34 years, followed by paretic dementia at 57, diagnosis of the latter being confirmed by necropsy.
4. A man who contracted syphilis at 29 developed an attack of acute excitement at 37, from which he recovered in 9 months and seemed well for over 5 years, when he suddenly became excited again and showed a manic-depressive reaction with the physical signs and laboratory findings of paretic dementia. This case is not quite clear as the first attack may also have been due to paretic dementia followed by a remission of 5 years.
5. A woman had attacks of the manic depressive type at 26 and 44 and then at 53 a well defined infection—exhaustion psychosis.

"Looking at the subject in the abstract light of speculation, we may make the generalization that any two psychoses may occur in the lifetime of an individual. For instance, a man may have an episode of katatonia and recover; a few years later he may have delirium tremens following prolonged alcoholism. He may recover from this and be placed in an environment new to him and at the same time meet with sexual difficulties from

---

(9) Jour. Nerv. and Ment. Dis., 1907, Vol. 34, p. 447.
(1) Med. Rec., 1911, Vol. 80, p. 974.
(2) New York State Hosp. Bull., February, 1914.

which he develops a paranoid state with recovery. He may have typhoid fever and an infection—exhaustion psychosis and lastly he may round out his psychotic history by arteriosclerotic dementia and general paresis. All this is of course merely an imaginative exercise, but as a matter of fact there seems no reason why a toxic psychosis, for example, should not develop in an imbecile, a praecox, a manic or a paranoic."

After further discussing the theoretical aspects of the problem, the author tabulates the following 41 cases of combined psychoses sifted from a total of 21,350 cases admitted to the Government Hospital for the Insane.

ASSOCIATED WITH DEMENTIA PRAECOX.

Alcoholic psychosis	6
Imbecility	3
Arteriosclerotic dementia	2
Infection-exhaustion psychosis	2
Hysteria	1
Total	14

ASSOCIATED WITH MANIC-DEPRESSIVE.

Senile dementia	4
Alcoholic psychosis	2
Arteriosclerotic dementia	2
Infection-exhaustion psychosis	1
Total	9

OTHER COMBINATIONS.

Psychopathic character and prison psychosis	2
Arteriosclerotic dementia and infection-exhaustion psychosis	2
Senile dementia and alcoholic psychosis	1
Senile dementia and infection-exhaustion psychosis	1
Psychopathic character and alcoholic psychosis	1
Arteriosclerotic dementia and alcoholic psychosis	1
Prison psychosis and cerebral lues	1
Paranoid state and general paresis	1
Imbecility and arteriosclerotic dementia	1
Infection-exhaustion psychosis and paranoid state	1
Paranoia and senile dementia	1
Total	13
Cases resembling praecox and manic-depressive	5
Grand total	41

Insanity in Children. John H. W. Rhein[3] has studied the literature exhaustively and finds very few reports of true psychoses in children under 15 years of age, such mental disturbances as those dependent on chorea, epilepsy, hysteria, syphilis as well as idiocy being excluded. Dementia praecox also is excluded. The first case in the literature appears to be one of mania recorded by Coelius Aurelianus 1,400 years ago. The second one is a case of melancholia in a girl of eleven years reported by Berkham in 1750. Altogether Rhein could collect only 44 cases which seemed worthy of citation. Manic-depressive insanity is by far the most common form, 32 of the cases being of this kind, 13 of the circular form, 11 of the manic form and 8 of the melancholic type. Next in frequency is post-infectious insanity, which, according to Ireland, is often found associated with hereditary predisposition. Scarlet fever, diphtheria and typhoid fever are the infections most frequently concerned. Hallucinations and delusions are common in this form, but not in the manic-depressive cases. Aside from these forms of true insanity, psychasthenic states are reported, characterized by mental instability, depression and excitability associated with phobias and hypochondriasis.

In this connection it is interesting that, according to C. Macfie Campbell,[4] 236 out of 708 patients treated at the out-patient department of the Phipps Psychiatric Clinic during the first year of its existence were children under 16 years of age. The conditions for which the children were brought to the dispensary varied very widely, some being brought for small habits like thumb-sucking or for tics, while others suffered from severe mental defect. Twenty-five of the children were practically normal, while 148 showed a definite intelligence defect. Various moral defects such as habits of stealing and psychoneuroses were fairly frequent. Only four or five of the children had actual psychoses, the type of which is not stated in the paper, which deals with the out-patient work in a general way.

[The engrafting of actual psychoses on defective men-

---

(3) Am. Jour. Insan., 1915, Vol. 71, p. 471.
(4) Ibid, p. 439.

tal states, with especial reference to dementia praecox, or "pfropfhebephrenia," as it is called in such instances, is discussed in the next chapter.

The Classification of Mental Diseases is still in an unsettled state and is never the same in any two textbooks we may examine. Reflecting as it does the author's view of what is essential and what non-essential the classification as given in the table of contents of a new book on psychiatry is always of interest. It is natural that in this year of turmoil in Europe the only noteworthy new book on psychiatry should be produced in America. As it is written by such distinguished authors as Smith Ely Jelliffe and William A. White,[1] we are particularly keen to analyze their classification, knowing that it is based on broad knowledge of the subject. First of all, we are gratified to find that Part III of the work, which contains all of the mental diseases, has the title: Psychical or Symbolic Systems (Part I being Physico-Chemical Systems, *i. e.*, vegetative or visceral neurology, and Part II, Sensori-Motor Neurology) and that at last authors have appeared who possess the courage to place hysteria and the other psycho-neuroses where they really belong, in the class of diseases of the mind. Their classification of diseases of the psychic or symbolic systems (neuroses and psychoses) is as follows:

I. The Psychoneuroses and Actual Neuroses.
    A. The Psychoneuroses.
        1. Hysteria.
        2. Compulsion neurosis.
        3. Anxiety hysteria.
    B. The Actual Neuroses.
        1. Anxiety neurosis.
        2. Neurasthenia.
    C. Mixed Neuroses.
II. Manic-Depressive Psychosis.
        Manic Phase. Depressive Phase. The Periodical Types. The Cyclothymias. The Mixed States.

---

(1) Diseases of the Nervous System, A Textbook of Neurology and Psychiatry, 796 pages. Philadelphia and New York, Lea & Febiger, 1915.

III. The Paranoia Group.
    Paranoia of Kraepelin. Mixed and Aberrant Forms. Paraphrenias.
IV. Epilepsy and Conculsive Types of Reaction.
    Classical Epilepsy. Attenuated Forms. Affect Epilepsies. Epilepsies of Gross Brain Disease.
V. Dementia Praecox (Schizophrenia) Group.
    Dementia Simplex. Hebephrenia. Katatonia. Paranoid States. Mixed and Atypical States.
VI. Infection-Exhaustion Psychosis.
    Prefebrile, Febrile, and Postfebrile Psychoses. Exhaustion Psychoses: Collapse Delirium; Acute Hallucinatory Confusion (Amentia). Typhoid Psychoses.
VII. The Toxic Psychoses.
    Alcoholism: Drunkenness; Chronic Alcoholism. Delirium Tremens. Korsakow's Psychosis. Alcoholic Hallucinosis. Alcoholic Pseudoparesis. Alcoholic Pseudoparanoia. Alcoholic Epilepsy. Dream States. Dipsomania.
    Opium.
    Cocain.
    Miscellaneous Intoxicants.
VIII. Psychoses Associated with Somatic Disease.
    Apoplexy. Traumatic Psychosis. Acute Chorea. Chronic Chorea. Paralysis Agitans. Multiple Sclerosis. Polyneuritis. Pellagra. Heart Disease.
IX. Presenile, Senile, and Arteriosclerotic Psychoses.
    The Presenile Psychoses: Involution Melancholia. Other Psychoses of the Period.
    The Senile Psychoses: Intermediate Conditions. Normal Senile Involution. Simple Senile Deterioration. Senile Delirium. Presbyophrenia. Alzheimer's Disease.
    Arteriosclerotic Psychoses: Arteriosclerotic Brain Atrophy. Subcortical Encephalitis. Perivascular Gliosis. Senile Cortical Devastation.

X. Idiocy, Imbecility, Feeble-Mindedness, and Characteriological Defect Groups.
Feeble-Mindedness.
Imbecility: Moral Imbecility. Idio-Imbecility.
Idiocy.
Psychopathic Constitution.
Anomalies of the Sexual Instinct.

Paretic dementia (general paresis) is not found in this list because it is considered together with other forms of syphilis of the nervous system, and under the subheading of "parenchymatous" cerebral syphilis, which is its proper place. Similarly, the psychoses dependent on thyroid and other internal secretion disorders are discussed in the excellent chapter on the "endocrinopathies."

It is worthy of note that the involution or "climacteric" melancholia is placed with the presenile psychoses, emphasis being laid on the time of life at which it occurs rather than on its clinical resemblance to other forms of depression, which has led some writers to place it in the manic-depressive group. In placing the word "schizophrenia" in parenthesis after dementia praecox, the authors acknowledge their regard for Bleuler (see Practical Medicine Series, 1913, Vol. X, p. 214) but are not willing to sacrifice the now so firmly established term dementia praecox. They follow Kraepelin's latest edition in having both dementia simplex and hebephrenia as forms of dementia praecox, the former comprising the mild and abortive forms, the "formes fructes" of the French. "Many such cases are found in the ranks of the criminals, hoboes, prostitutes, pseudogeniuses, cranks, and eccentrics. . . . An analysis of the life histories of this class of cases shows quite regularly a constant tendency to slip from under all forms of responsibility, and a lack of capacity for any kind of continuous application, and inability to develop the habit of work. They characteristically resort to the hobo type of existence, are unable to adapt, with any degree of efficiency at all, complex conditions of life, and wander from place to place, occupying one position after another from which they are either dismissed because of inefficiency, or leave voluntarily, giving reasons for so doing which are totally inadequate.'' Hebephrenia is used in the usual sense, comprising the more severe cases than the dementia simplex group. ''It, however, is not essentially different, being practically the same condition occurring with greater severity, more apt to be somewhate acute in its onset, and manifesting itself more prominently by hallucinations and delusions.''

Aware of the Freudian tendencies of the authors, we eagerly turn to their discussion of the nature of dementia praecox, but thanks to their broad knowledge they do not champion any exclusive psychogenic view. While maintaining ''that the mental symptoms are capable of interpretation solely at the psychological level,'' they admit that ''for an understanding of the whole disease process it must not be lost sight of that recent investigations are tending to show more and more that there are distinct biochemical disturbances during life, and pathological changes are being found after death. In any case the acute cases that lead to death must be conceived as having profound bodily changes correlated with the psychic symptoms.'' After declaring as unnecessary from a medical standpoint ''the arbitrary separation of the individual into two distinct and mutually exclusive parts, namely, mind and body,'' and as futile the efforts at specific correlation between physical findings and mental symptoms, the authors maintain that ''it is quite possible to express the symptomatology of the disease, to describe it, to reconstruct the psychosis, so to speak, purely in psychological terms. For the present, therefore, the disease must be described psychologically, and the explanation of the mental symptoms must be sought psychogenetically, without, however, forgetting that there are certain somatic changes which are pretty generally attached to the symptomatology of the disease process and which must ultimately be made to fit into the general rubric before a complete understanding of the entire situation is had.'' The psychologic side is discussed in an extremely interesting manner, the main idea being that dementia praecox represents ''a certain type of reaction to a mental conflict, resulting in a splitting of the psyche and the outcropping of unconscious mental trends to the surface of the mental life. The patient is confronted with a situation to which he cannot adequately adjust, which is absolutely inacceptable and impossible, and he is therefore driven away by his incapacity to assimilate it and cast back upon himself.''

MENTAL DEFECT AND DELINQUENCY.

The Individual Delinquent. A medicopsychological work which has received an unusual amount of commendatory notice by critics and reviewers is ''The Individual Delinquent—A Text-Book of Diagnosis and Prognosis for All Concerned in Understanding Offenders''—by William Healy (pp. 830; Boston; Little, Brown and Co.). The whole point of view of this volume is challenging, as it firmly insists on bringing the professional wares of the medical man and the clinical psychologist into the service of the law in its dealings with social offenders. Heretofore there have been various attempts at introducing the anthropological standpoint to the legal profession, for the most part on the basis of some theory; in this work we find no particular thesis presented. Healy offers a wide collection of facts as they have been uncovered by investigation, and insists on the whole ascertainable background of the given case being taken cognizance of in each instance. This, after all, is the insistence of the careful medical man, particularly of the psychiatrist, who develops his prognosis, and perhaps even his diagnosis, in the light of heredity, developmental and environmental conditions, as well as through immediate study of the individual.

No entire summary of this large work is possible here; some of the more important findings are as follows:

The author makes it clear that the place of the medicopsychologist is right at the judge's side, acting with him in conference concerning the best adjustment of the case, that the offender may be started along happier paths and that society may be better protected. There is, naturally, opposition by Healy to the idea of the physician testifying from a partisan standpoint when social issues are before the court of justice. The actual part that the medicopsychological student can play in court life he has ascertained by experience. He regards it as one of his most important findings that when there is some competent person to represent the standpoint of the family physician, someone who concerns himself with the offender and the offense as problems to be understood and solved, an entirely different attitude towards the whole court proceeding is frequently taken by even the offender and his family. Very much more than the police know is readily volunteered, and very often it is possible to demonstrate in a commonsense way the correlation and the coincidence of the interests of the offender and of society. It certainly is a fact that since medical and social work was introduced, a few years ago, in court life, there has been a tremendous evolution in the relationship of the work of courts to community conditions.

Discussing methods of studying the offender, the author strongly asserts the great necessity for adding to any cross-section study of an individual, a medical history of his development and of his family. Very complete schedules of data are offered by way of memoranda for the investigator. While it is true that "the only safe way to ascertain the driving forces which make for social offense is to get at the mental mechanisms antecedent to the behavior in question," still these mental mechanisms are best investigated by "physicians who have been especially engaged with psychiatric and neurologic problems."

The author steadily maintains that nothing is so directly important as the psychologic or mental investigation of the case, and he offers the following formulation of a plan for inquiry:

1. What is the subject's mental ability, independent, so far as ascertainable, of the results of formal education? This should be estimated in terms of strength or weakness of

(a) The subject's general ability or general intelligence (if such a thing as general intelligence there be).

(b) The subject's special abilities—selecting for investigation here those abilities or functions which, since we are dealing with social conduct, seem most likely to be related to social action, success or failure.

2. What has been the result of formal education, interpreted in the light of its conditions and extent?

3. Does the individual suffer from aberrational mental functionings, whether border-line or fully-developed psychoses?

4. What are the individual's preponderating mental interests, as stated in terms of mental content, imagery, ideation and the like?

5. Has the individual important peculiar characteristics, particularly of emotional or moral life, leading to impulsive or other abnormal action?

6. Has the individual suffered earlier experiences, mental or environmental, which have, through the arousal of inner conflicts, complexes, inhibitions or resistances, interfered with the satisfactory, smooth and healthy working of mental life? This is peculiarly, in modern terminology, a study of mental mechanisms.

Comments on the methods for carrying out the above inquiry are too lengthy to be even summarized here. A critique on the giving of mental tests is offered and many illustrations of different types of tests are given in the three chapters on Working Methods. Above all things, common sense in making observations and examinations of all kinds is the keynote to practical success. Mere use of mental tests, such as are nowadays widely advertised, may by no means be sufficient to give the most accurate knowledge concerning the causations of the individual's career.

The bearing of the methods of psychoanalysis have been discussed in one section on the subject, and also later in a chapter on Mental Conflicts. Several reviewers, themselves experts in psychoanalysis, have particularly commended this portion of the work for its appreciation of the practical issues and of the possibilities of using what the psychoanalysts have taught, in a modified form. Nothing Healy has found more striking than the fact that when working with young offenders, mental conflicts, clearly leading to the most serious aberrations of conduct, can be dug up without going through the extremely long process that the analysts find is necessary with older people of more complex lives. In the special chapter on Mental Conflicts and Repressions, the actual results in heading off definite careers of bad conduct by exploring and meeting the essentials of the hidden mental trouble, are plainly set forth.

In the chapter on Statistics, the author sets out by showing the weakness of gathering figures of any kind concerning this or that peculiarity of offenders, as separated from other possible causative factors: "The offender with bad eyesight, from a family of poor earners, may be the victim of obsessional mental imagery, or of character-destroying habits, or mental defects—any one of which conditions is known to produce delinquent tendencies with or without bad eyesight and poverty. Then, on the contrary, plenty of individuals from poorly-paid families or with bad eyesight have not at all turned towards delinquency. Thus the only efficient method of gathering highly valuable statistics of delinquent causation is to proceed by scheduling evaluated facts as they are discerned through study of the individual offender." But after all, "statistics will never tell the whole story."

Healy took 1,000 consecutive cases of young repeated offenders, studied at the only age when causative factors may be fairly known. From the pages on this subject we may cite the following:

Markedly defective early developmental conditions was found in 214 cases.

Decidedly abnormal physical conditions, including excessive physical development, in 273 cases.

Mental abnormalities or peculiarities of some kind in 455 cases.

Analysis of the last shows mental subnormality in about 190 cases, and aberrational types number about 160 cases, including 60 cases of epilepsy. The other mentally abnormal cases include such peculiarities as marked cases of adolescent instability, of extreme suggestibility, of constitutional inferiority, etc. Healy does not offer these as accurate percentages to be applied generally in the field of criminology. He particularly studied repeated offenders, and many of the cases were already selected for him because of some mental peculiarity recognized by the families or officers of the court.

(Another study,[5] much more to the point in giving us

---

(5) Jour. Crim. Law and Criminol., November, 1914.

accurate percentages concerning mental defectives among the general run of young offenders, also emanates from the Juvenile Psychopathic Institute of Chicago. Dr. Augusta F. Bronner undertook an extremely careful investigation of five hundred unselected cases of young offenders as they were brought into the Detention Home. This is, undoubtedly, the most careful study that has been made on the subject and has already been widely quoted. She suggests that the figures which have heretofore been given out concerning the number of the feeble-minded among offenders, have been steadily derived from highly selected groups; they have been taken from institutional inmates who have been found already not to succeed on probation, or they have been concerned with particularly dissolute and low types which are to be met usually in our houses of correction. The results of her investigation show that at this age, namely, 14 to 16, when offenders are well known practically all to begin their careers, the proportion of mentally normal individuals ranges about 90 per cent. Dr. Bronner in this paper warns of the danger of passing judgment on cases at the immediate time of trial, when the attitude of all concerned is likely to lead to grave errors of judgment.)

In the statistical analysis of abnormal physical conditions, Healy finds one of the most striking facts to be concerned with physical over-development. He shows in charts that wayward girls, two-thirds of them, as seen by him, are considerably above the curve of the physiological norm, as evidenced by weight. Not a few boys, too, start off on careers of delinquency as a result of the restlessness which proceeds from early over-development. Numerically, the most common defect is of vision; next come nose and throat troubles. Many other conditions are enumerated, but poor nutrition, which is asserted to be so large a factor in introducing criminality in the older countries, certainly plays a very minor part with our better fed population. In only 27 cases did Healy observe very poor nutrition, and in 49 cases very poor general development. This shows, as the author frequently insists, the possibility of different findings in different places with different populations. The part that epilepsy plays in criminality is well recognized—this author found no less than 67 cases, and possibly 18 others. Over 7 per cent., then, were subject to some form of this disease (but here again it may be the lack of provision for epileptics in Illinois that is partly the cause of these large figures). Alcoholism, of course, figures very extensively. In no less than 311 instances, the parents, one or both, were distinctly alcoholic—that is, more than moderate drinkers. In only 22 of the 1,000 offenders, who average about 16 years of age, was there the slightest evidence of drinking. This shows how little drinking there is among young people in this country as compared to some of the countries of Europe, where children steadily are allowed beer, wine, and even brandy. Very excessive use of tea and coffee was noted in 43 cases, and tobacco in excess in 60 instances.

This volume embodies a study, by Doctors Edith Spaulding and Healy, of heredity as bearing on criminality. This has been published separately;[6] one section contains the main results. In father, mother, or grandparents, there were 82 cases of insanity, 12 suicides, 79 cases of criminality. Enumerating father or mother only, there were 39 cases of epilepsy, 79 feeble minded, 57 psychopathic individuals with very marked instability, 10 marked neuropathic cases, 20 instances of marked constitutional inferiority, 6 cases of drug addiction, etc. All told, inheritance of mental or physical abnormality was a predominating factor in 35 per cent. Heredity was not known to be an important factor in 54 per cent. (Of the 1,000 cases only 668 were found to have data sufficient to justify their being used for this study of heredity.) Among the 152 cases where no inheritance of mental defects or epilepsy was known, in 56 per cent. there was alcoholism of at least one parent. The authors undertook their study for the purpose of determining the fact of the inheritance of criminal tendencies as such. They finally conclude: ''Altogether there seems to be no proof whatever from our extensive material that there is such a thing as criminalistic inheritance apart from some otherwise significant physical or mental trait,

---

(6) Bulletin Amer. Acad. Med., February, 1914.

which in the offender and his forbears, forms the basis of delinquency."

The second part of the volume is mainly devoted to case studies of types. We note the following of special interest: the author definitely finds that there is inheritance of such peculiarities as excess of energy, irritable temper, and hypersexual tendencies. For the last a strong case is made through the study of several family histories.

Among developmental factors important for the student of delinquency there is, first, enumeration of conditions in antenatal life, of which, of course, congenital syphilis plays a major part. The author quotes those important studies from some European clinics, where cases of congenital syphilis have been followed up. Besides the physical and mental inferiority which sometimes results from this early disease of the organism, it seems to be well established that conduct difficulties are particularly prone to be found during later childhood in individuals infected before birth. Alcoholism and morphinism of the mother are mentioned also as causes of defect. The author takes the standpoint of Thompson concerning maternal impressions, stating that the effect of so-called prenatal influences in molding the mind or body of the unborn child has yet to be proven.

The peculiar relationship of developmental conditions to criminalism at the other end of life is shown in the section on Senility. Many senile delinquents are first offenders, and their offenses, out of all proportion to those committed at any other age, center about sex affairs. Statistics show this clearly. While, no doubt, involutional degeneration of the brain accounts in part for this, Healy believes that local physical irritation and local anatomic changes create the stimulus to which there is less than normal resistance.

In the chapter on the relationship of physical conditions to delinquency, the author, from his experience, agrees with the deductions from Goring's splendid research that "the physical and mental constitution of both criminal and law-abiding persons of the same age, stature, class and intelligence, are identical." Healy finds every reason, in this country, to disagree with the older notion that criminals form a species by themselves.

The part that eye troubles, defective hearing, and nose and throat obstructions may play in causing delinquency is considered. Speech defects, it is interesting to note, have a peculiar tendency towards making the individual anti-social; and the statements concerning character deterioration that have been made so often by specialists in speech defects find here their justification in the delinquency which this author has so repeatedly observed upon this basis. Various other physical ailments, such as enuresis, irritation of sex organs, etc., are mentioned.

Under the head of developmental physical abnormalities, the interesting points are those which show the relationship between delinquency and premature puberty, general over-development, and over-development of sex characteristics. The discussion of developmental age norms is of peculiar interest to the medical man.

On account of its far-reaching importance, alcoholism is discussed from the standpoint of the various ways in which it may be a factor in producing delinquency. These are given under the heads of (a) Heredity, (b) Alcohol and Procreation, (c) Antenatal Conditions, (d) Developmental Period, (e) Environmental, (f) Relation of Delinquency to the Use of Alcohol by the Delinquent. Under this last head there is discussed the important point of the effect of alcohol on adolescents and on mental defectives.

The use of morphine and cocaine is considered and the effects summarized. It seems significant that Healy finds the over-use of tea and coffee so clearly a factor in producing an excitation and restlessness which makes the individual unable comfortably to endure school life. From this, truancy is the natural reaction, and with truancy arises the usual range of anti-social temptations and tendencies. About the use of tobacco the author says: "Almost the only way in which tobacco makes for delinquent tendencies is by causing an unstable nervous system, and this it certainly does when indulged in excessively by young people. There have been many exaggerations of the bad effects of smoking. Only in occasional cases where tobacco was begun very early have we found the individual directly led through the use of it into anti-social behavior.'' Elsewhere, however, it is stated that smoking has in some a peculiar relationship to masturbation—and this secret habit engenders other anti-social tendencies.

The effect of environmental factors, including the associations into which the offender is thrown by the processes of law, and the causes which lead to professional criminalism are dealt with in two chapters, but about these we need not be concerned here. The next section treats of the more purely psychological considerations, namely, Criminalistic Mental Imagery and Criminalistic Mental Habit.

The long chapter giving case studies of mental conflicts and repressions is of special interest to the modern neurologist. Healy finds these peculiar mental phenomena, which result sometimes in the most extravagant forms of social misbehavior and indeed whole careers of misconduct, to be based mainly on the following emotion-producing experiences: (a) uncertainty and suspicion on the part of the child concerning parentage; (b) dwelling on deceit and lies indulged in by those presumably most to be trusted; (c) various secret experiences of sex life; (d) harsh treatment and false accusations by those from whom affection and protection is naturally expected; (e) other minor causes, such as homesickness, teasing on account of speech defect, etc. It seems that nostalgia has been notorious in Europe as a cause for severe outbreaks of misconduct which would seem to have no relationship to the fact of homesickness itself. Cases bearing on these points are given in some detail.

The remarkable correlation of epilepsy and criminality is considered at length: ''The mental peculiarities of epileptics which have special interest for the student of offenders are (a) the strange variabilities, easily discerned by examination or observation; (b) the remarkable general characteristics (the so-called character) typical of the epileptic; (c) the gradual mental deterioration, which is so peculiar to the disease in its well-marked forms that some specialists say it is one of the principal points of diagnosis.''

Mental defect and its relationship to delinquency is discussed with case histories in four chapters. Dr. Healy undertakes to give for the sake of better understanding by medical men and lawyers, the best definitions and classifications. He particularly shows the chaos which has existed unnecessarily in this field by reason of the over-lapping of terms used. The best two definitions, the author thinks, are given by the British Royal Commission and the American Association for the Study of the Feebleminded, the first on the basis of social inefficiency, the last according to the findings by tests. A very clear schedule of the classification is given. Under the head of Mental Defectives, we find the feebleminded, with the sub-classes, idiots, imbeciles, and morons; also the subnormal, those who stand between the feeble minded and the normal. Then there are other individuals defective in special and limited abilities only; these are given with enumeration of the sub-classes which have defects of social importance. Then there are the feebleminded with special abilities, such as unusual powers of conversation, which lead them to play a peculiar rôle in the social order. The bearing which the results of tests of various kinds have upon the diagnosis of these conditions is given to some extent in the classification, but particularly in the case histories themselves. The subnormal verbalist comes in for considerable discussion—this is the type of individual who continually is failing to do well, but who makes a good presentation of himself through the excellent use of language, so that people think he has good ability. Under the head of Special Mental Defects, we find examples given of language defect, defect in arithmetical ability, defect in judgment and foresight, defect in self-control. This last class is well recognized in some of the reformatories and might well form a subject for more extended study.

A class of troubles that has received little attention at the hands of writers on mental defect is mental dullness from physical conditions, including general physical faults, such as anemia, toxemia, etc., and also through the debilitation of bad sex habits. The author gives several cases where the result of cessation of these habits seems to prove the point.

The definition given in the chapter on psychic constitutional inferiority is of interest: "Psychic constitutional inferiority may be recognized by chronic abnormal social and mental reactions to the ordinary conditions of life, on the part of one who cannot be classified in any of the groups of the insanities, neuroses, or mental defectives. The individual generally shows physical anomalies, either structural or functional." The author summarizes the literature on this important subject and gives illustrative typical cases. In this connection, he particularly decries the use of the loose term degeneracy, asking for much more clearly defined terminology.

The chapter on Mental Aberrations gives some illustrations of the relationship of typical insanities to criminalism. Much more unusual is the chapter on minor mental aberrations, in which we read of the part that hypomania, or constitutional excitement, the psychosis of chorea, head traumatism, etc., may play in causing delinquency. The author finds amnesic fugues much more rare in this country than they are in Europe, but cites some typical cases from his experience.

Other minor mental aberrations of significance for the student of delinquency are those of hysteria, adolescence —of which there is a long account given—alcoholism, and drugs.

The following chapter is on mental peculiarities, namely, abnormal social suggestibility, the peculiarities of adolescence, abnormal love of excitement and adventure, the peculiarities of racial characteristics, etc. Pathological lying and accusation is dealt with in one chapter, but has received greater elaboration in another work by this author, abstracted in the following article.

The final sections of this book deal with pathological stealing (so-called kleptomania), pathological arson, vagabondage, etc. Among other points, there is a discussion of so-called "moral imbecility" and "moral insanity," which has received so much attention at the hands of medical writers since the first use of the former term by Prichard in 1835. Surveying the literature in the light of his own findings, which are negative here, our author concludes that if the true "moral imbecile" exists at all, that is, a person who has an innate moral defect apart from intellectual defects, he must indeed be a *rara avis.* Here, again, the author deplores the use of terms which lead to confusion of practical issues.

The text is followed by 17 pages of titles from authorities cited previously. To these one may turn for much splendid material, such as the first work given, which is Abderhalden's massive bibliography concerning the problems of alcohol and alcoholism—a volume little known in America.

Pathological Lying, Accusation and Swindling is the title of a monograph by William Healy and Mary Tenney Healy.[7] The work is based on detailed study of 27 cases observed at the Juvenile Psychopathic Institute of Chicago, of which Dr. Healy is the director, as well as on a complete review of the literature, almost none of which is in English.

Definition: Pathological lying is falsification entirely disproportionate to any discernible end in view, engaged in by a person who, at the time of observation, can not definitely be declared insane, feeble-minded or epileptic. Such lying rarely if ever centers about a single event; although exhibited in very occasional cases for a short time it manifests itself most frequently by far over a period of years or even a lifetime. It represents a trait rather than episode. Extensive, very complicated fabrications may be evolved. This has led to the synonyms mythomania and pseudologia phantastica.

"It is true that in the previous literature, under the head of pathological liars, cases of epilepsy, insanity and mental defect have been cited, but that is misleading. A clear terminology should be adopted. The pathological liar forms a species by himself and as such does not necessarily belong to any of these larger classes. It is of course scientifically permissible, as well as practically valuable, to speak of the epileptic or the otherwise abnormal person through his disease engaging in pathological lying, but the main classification of an individual should be decided by the main abnormal condition.''

---

[7] Criminal Science Monograph No. 1, Suppl. to Jour. Amer. Inst. Crim. Law and Criminol., 286 pages. Little, Brown & Co., Boston, 1915.

Similarly, pathological accusation is indulged in apart from any obvious purpose and like pathological swindling, it is an outgrowth of the tendency to lying. As to the relation of lying to delinquency, analysis of 1000 young repeated offenders studied by the authors shows that lying was a marked characteristic in 15 per cent. of the males and 26 per cent. of the females and false accusations—only recorded when of an excessive and dangerous sort—were found in 0.7 per cent. of the males and 5 per cent. of the females.

The bulk of the work is taken up by the description of twenty-seven cases, nineteen of which occurred in mentally ''normal'' persons, the others in ''borderline'' types. The authors agree with previous writers that an unusual number of the pathological liar group show great aptitude for language. This is shown by their general conversational ability and by the fact that many of them have found out themselves that they had capacity for writing compositions and stories. Three of them had definitely commenced long stories or novels. It is most unusual among other offenders to find evidence of any such tendencies. It is clear that the native traits making for verbal fluency are strongly correlated with pathological lying.

A characteristic of pathological liars is undoubtedly a deep-set egocentrism, as has been previously shown by Risch,[8] who states that mental processes similar to those forming the basis of the impulse to literary creation in normal people lie at the foundation of the morbid romances and fancies of those afflicted with pseudologia phantastica. The bent of thought is egocentric and as the morbid liar and swindler can think of nothing but himself, fiction and real life are not separated as in the mind of the normal author, and the morbid impulse which impels him to fabulate is bound up with the desire

---

(8) Allg. Zeitsch. f. Psychiat., 1908, Vol. 65, p. 576.

to play the rôle of the person depicted. Risch maintains that nearly all of these cases were burdened with bad inheritance, showed instability and psychic excitability, and that the entire symptom complex arises upon a basis of degeneracy. The present authors also find in their subjects an undue amount of self-assertion together with very little sympathy for and little appreciation of the opinions of others. Nearly all of their cases show the importance of the imagery of the heroic rôle of the self and how frequently it occupies a central stronghold. The importance of bad heredity is fully corroborated by the authors, who worked out the following data in their nineteen mentally "normal" cases:

Insanity in the direct family (4 of these being a parent)	6
One or both parents severely alcoholic	6
Criminal or very dissolute parent	4
Suicide of parent	1
Extremely neuropathic parent	1
Syphilitic parent	2
Epileptic parent	1
Unsatisfactory data	2
Reliable data showing normal family stock	2

It is an interesting fact that of the nineteen mentally normal cases, only one was male. "A general observation by practical students of conduct, namely, that females tend to deviate from the truth more readily than males, is more than thoroughly borne out here. There are certainly several social and psychological reasons for this, but they need not be gone into here. If our figures seem not to be corroborated by the findings of previous students it is only because the figures are not comparable—the latter have mixed the mentally abnormal with the pathological liars proper." Masturbation and early untoward sex experiences and vicious associations in general are conspicuous features of the case histories. Direct psychic contagion may have played a part, as in five out of the nineteen "normal" cases some other member of the household was known as a chronic prevaricator. Mental conflicts with repressed emotions concerning sexual matters or questions about family relationships sometimes had preceded the appearance of the tendency to lying. Aggravation of the tendency during menstruation and at periods of particular mental stress was noted. Running away from home is a frequent feature and is looked upon as part of the general instability of character, the unwillingness to meet the realities of life and the inclination to escape consequences. As a matter of fact frequently the pathological liar gets himself in a tight place by lying and then the easiest escape is by running away from the scene.

As to prognosis, the authors state "first and foremost stands out the fact that cure of the tendency sometimes happens even after long giving way to it. In this statement we are not contradictory to some previous writers." Several apparently unfavorable cases improved steadily to a very marked degree. The difficulties of treatment are naturally great, as frequently a total change of environmental conditions is necessary. Much is accomplished by endeavoring to impress the person with the undesirability and troublesome consequences of the habit of lying. The first ethical instruction may well be based upon the idea of self preservation, which, after all, is the backbone of much of our morals. Whenever lying is discovered the individual should be checked up and made to go over the ground and state the real facts. The special powers for self expression and use of the imagination should be utilized and given full sway in harmless directions.

Psychoses Engrafted Upon Feeblemindedness. This year much work has been published tending to elucidate the problem to what extent psychoses, especially dementia praecox, occur in congenitally mentally defective individuals. Before entering on a review of recent literature it is interesting to note that Kraepelin in the latest edition of his textbook (1913) records the onset of 3.5 per cent. of 1054 cases of dementia praecox as being during the first ten years of life. The Germans use the term "pfropfhebephrenia" to designate dementia praecox in the feeble-minded, the word "pfropf" meaning graft and the term implying that the psychosis is superadded or engrafted. M. Wasner[9] gives Kraepelin credit for the discovery that dementia praecox sometimes arises on this basis, and points out that a source of difficulty in diagnosis lies in the fact that katatonic symptoms may occur in imbeciles and persist for weeks without any actual complicating dementia praecox. While Kraepelin is quite free to admit a superadded psychosis, Weygandt, the noted Hamburg psychiatrist and investigator of mental defectives, ascribes the katatonic features, such as echolalia, echopraxia, rhythmic movements, and katalepsy to low-level psychomotor discharges in the undeveloped brain, and is slow in assuming the engrafting of dementia praecox on the defective state. Another German student of this vexed problem, Luther, also ascribes the dementia praecox-like symptoms in imbeciles to specific and characteristic brain phenomena not related to those of the acquired psychosis. Wasner himself reports 10 cases observed in an institution for feeble-minded in Stettin, in which he believes true dementia praecox arose on the basis of imbecility. Most of them had one or more attacks of apparently typical katatonic excitement or stupor, five of them without further mental deterioration resulting. Dementia praecox occurring in imbeciles does not differ from that occurring in previously normal individuals, except that in the paranoid form the delusions show poverty of ideas and imagination.

H. Valentine Wildman, Jr.,[1] believes that the comparative rarity of reports of psychoses in the feeble-minded is more due to lack of interest in the subject than to lack of material. In the state hospitals there are numbers of constitutional inferiors with various psychoses. They belong to the more highly developed type of imbecile. Idiot asylums and institutions like the Clearing House for Mental Defectives at the New York Postgraduate Hospital furnish more abundant material. The author finds Barr's classification of defectives based on clinical types the most useful:

---

(9) Zeitschr. f. d. ges. Neurol. u. Psychiat., 1915, Vol. 29, p. 168.

(1) Jour. Nerv. and Ment. Dis., 1915, Vol. 42, p. 529.

I. Idiots
   1. Mongolian
   2. Negroid
   3. American Indian
   4. Cretinoid
   5. Hydrocephalic
   6. Microcephalic

This group includes individuals who are mentally under three years of age.

II. Imbeciles
   1. Mental
   2. Moral

This group includes all the rest, but those above 12 to 14 years mentally have been separated as another group.

III. Morons
IV. Epileptics
V. Psychoneurotic-hysterical individuals

The chief types of mental derangement are divided into the following groups:

1. Amentia
2. Manic-depressive and allied states
3. Dementia praecox and allied states
4. Epileptic with episodes of excitement
5. Psychoneuroses
6. Moral insanity

The first form is found chiefly in the lower grades of idiots and presents no features of interest.

Manic-depressive states and allied conditions are evident among the feeble-minded more as an unstable emotional state than as a frank attack, except in those constitutionally inferior individuals so frequently seen in state hospitals. The course and varieties are then the same as seen among the constitutionally normal. The prognosis is favorable as regards the attacks but they are more liable to deteriorate and of course never reach the status of a normal person.

Many of the feeble-minded insane belong to the group of dementia praecox and their chief characteristics are inaccessibility and mannerisms. Their attitude is indifferent, they pay little attention to their environment and show marked diminution of the emotions. The author states that it is hard to discover in what way the deterioration of a mental defective differs from that seen in the dementia praecox of a previously normal individual.

The psychoses of the high-imbecile are discussed by Henry J. Berkley,[2] who lays stress on the tendency to rapid deterioration of imbeciles at the age of adolescence, which is frequently partly caused by alcoholism, sexual abuses and excessive use of tobacco. Thefts, vagabondage and mendicancy are common.

"Not infrequently, after a course of dissipation, the defective inherited protoplasm comes to the succor of the family pride. A few months of excesses and the hereditary weakling becomes passive, inert and unable to take care of himself; in other words, he becomes demented, and seeks the sheltering walls of an institution, to be cared for to the end of his days.

"There seems to be some law of premature senescence descending upon members of the imbecile class about the age of adolescence that renders a future development of viciousness as well as licentiousness impossible—an impossibility perhaps due to some disturbance in the correlation of the internal secretions. In any event, the mental development comes to a stand-still, with eventual retrocession; it may be after the lapse of only a few months. It should be remembered in this connection, as having a direct bearing upon the subject at issue, that the age of puberty and adolescence is the most trying period in the evolution of the higher cerebral association fibers, rapid growth of the body occurring with advancing maturity of the sexual system, and in these individuals the cytoplasm necessary for successful development is both deficient and defective. Hence a rapid decline of the neural vitality and a terminating mental reduction.

"Alcoholism, syphilis, the excessive use of tobacco, late hours, as well as over-drain upon the sexual organs, all play a decided and important part in the immediate mental downfall of the defectives. Few examples of hallucinations are found without some antecedent history of alcoholic misuse.

---

(2) Bull. Johns Hopkins Hosp., September, 1915.

"The stigmata of degeneration in the high-imbecile class are much less frequent and pronounced than in the lower types; the physiognomy is less explicit in its tale of intellectual barrenness. In fact, many of the so-called moral, emotional or impulsive cases are sufficiently high in the intellectual scale not to portray to the untrained mind their actual degree of weak-mindedness and, accordingly, among the masses, they pass for normal individuals. It has been said that clothes make the man and certainly a well-groomed individual offers less to the eye, that is suggestive of mental defect, than those that are unkempt and untidy. But, by examination with the Binet method, or with the simpler arithmetical tests, together with questions as to judgment and insight, a fair knowledge of the degree of mental endowment may be ascertained within a few minutes, and the results are often surprising, showing as they do an incompetence that was entirely unsuspected from the surface.

"The psychoses of the moron class are extremely varied, complicated, interesting, and have not been sufficiently studied, mainly because the majority of mental workers have not been taught to recognize the imbecile in his highest development, when he stands nearest to the normal man; and although they recognize that in certain cases running the course of an atypical katatonia, hebephrenia or early dementia the patients are of subnormal mental grade, they lay but little stress upon this fact.

"Grading carefully from the lower types of imbecility to the moron group, the last showing but a few physical and still fewer gross psychical defects, we find that a high percentage of the permanent inhabitants of institutions (excluding seniles and paretics) have defects in their mental gearing of the most varied degrees and characteristics, with which is coupled a psychosis.

"Naturally, the insanities of the high-imbecile fall among recognized types of adolescent psychoses, but at the same time and in endless variety they depart from classical cases of these maladies in symptomatology and duration."

After a description of the various types of psychoses the author states:

"We especially desire to call attention in this paper to the fact that the high-imbecile is far more prone to the psychoses than a man of higher mental development; that practically all forms of simple and complex mental disorders are to be found among them, though a number are represented in simplified form; that the pernicious action of alcohol in particular, as well as of other drugs, although in less frequency, is much more marked in them than in normal man and is, in fact, the cornerstone of the vast majority of their hallucinations and delusions; finally, that few make a complete recovery from any of the forms of psychosis above enumerated, a terminal dementia of quick onset being the rule."

The relation of "pfropfhebephrenia" and dementia praecox to crime. W. J. Hickson[3] believes that Bleuler's development of the psychological approach to mental diseases has led the way to paths of investigation which, in the course of time, will convince all that dementia praecox is always hereditary and that there is a great deal of commonness in the hereditary background of both feeble-mindedness and dementia praecox. He believes that from 15 to 25 per cent. of the inmates of many feeble-minded institutions are cases of dementia praecox, either pure or grafted on feeble-mindedness ("pfropfhebephrenia"). They make up a large percentage of what are called cases of the erethric form of feeble-mindedness in contrast to the phlegmatic form. His experience as director of the psychopathic laboratory of the courts of Chicago has taught him the surprising frequency of dementia praecox among the juvenile delinquents.

"In the Boys' Court the percentage of dementia praecox in 929 cases was computed and it was found that 145 or 15.6 per cent of this group had dementia praecox. This group of 929 cases was subdivided as follows:

"In the average intelligence group of 95 cases we found 18 or 18.9 per cent. had dementia praecox.

"In the high grade borderland sociopath group we

---

(3) Illinois Med. Jour., October, 1915, Vol. 28, p. 262.

found out of 133 cases 21 or 15 per cent. had dementia praecox.

"In the group made up of the high, middle and low grade sociopath, consisting of 101 cases, 11 or 10.8 per cent. had dementia praecox.

"In the group made up of high, middle and low grade morons, consisting of 789 cases, we found that 94 or 12 per cent. had dementia praecox.

"In the Domestic Relations Court we are finding a very high percentage of dementia praecox; in a certain percentage of cases uncomplicated, but in the largest percentage complicated with alcoholism, alcoholic delusions of infidelity and other paranoid manifestations, a respectable percentage are cases also of pfropfhebephrenia.

"In a group of 342 cases examined from this court we found 71 or 20 per cent. to have dementia praecox; about 25 per cent. of these were outspoken alcoholics. These cases were rather selected ones, but nevertheless show what an important rôle this psychosis is playing in domestic disturbances."

Hickson concludes by reiterating the importance to criminology as well as to psychiatry of Bleuler's psychological methods which enable us to diagnosticate dementia praecox in many cases where it has been responsible for conflict with the law but where its presence has not even been suspected.

"The pfropfhebephrenia group deserves especial study on account of the deviations resulting in its diagnosis, course and prognosis, and it is my belief that when these conditions are fully evaluated we will have advanced another milestone in our understanding of the causes of crime, as we did when we found the high correlation between feeble-mindedness and crime; and let us hope it will be in this field, as it is in medicine, that the right diagnosis is half the cure."

"**The Feebly Inhibited.**" The first chapter of a study with the above title by Charles B. Davenport[4] deals with violent temper and its inheritance, the special problem being the classification of the cases of violent

---

(4) Jour. Nerv. and Ment. Dis., 1915, Vol. 42, p. 593.

temper met with in 165 family histories of wayward girls in state institutions, and the determination of the hereditary basis, if any. The data were obtained by field workers sent to the homes of the patients to examine as many members of the family as possible as to their emotional traits. In the reports of the field workers certain terms recur with great frequency, such as "quick temper," "violent temper," "ungovernable temper," "bad temper," "fits of temper," "tantrums," "anger," etc. In 79 of the 165 families, or 48 per cent., some individual with some such characteristic was found. On classifying the material it very soon appeared that the cases fall into three groups, as follows:

1. With at least one epileptic person in the pedigree.
2. With insane but not epileptic close relatives.
3. With neither insane nor epileptic relatives.

In the first group a large number of cases is related. In many instances the patient shows both epilepsy and bad temper and there are other members of the family who show these traits separately or together. A composite portrait of cases of this group is as follows:

"Patient early developed convulsions and showed signs of an ungovernable temper; even as a baby she would beat her head against the floor. She was tantalized, and would get into tantrums, when she would slap at members of the household, pull their hair, hit them viciously, and bite them, and even pull her own hair and scratch herself." These results confirm previous observations on the "epileptic temper."

In the second group there are 21 histories of temper in families with manic-depressive insanity or allied psychoses. Here a composite picture would be something like this:

"Patient has angry spells when she is much excited (with or without elation) and under these circumstances is often irritable, abusive, even assaultive and sometimes she storms, swears and makes a great disturbance; becomes easily discouraged, gets depressed, contemplates suicide."

In the third group the term hysterical bad temper seems appropriate. The diagnostic features are periodicity and an insight into conditions which prevents the patient from carrying out her worst threat. In a typical case the patient shows, especially at the menstrual period, an excited attack preceded by about two days of increasing restlessness. At the crisis the patient sings, swears, bangs about movables, threatens to take her own life and that of others. The acute attack lasts for a day or two and is followed by a period of depression and inactivity for a day or two, after which the patient's reactions return to a normal level. In this group threats of personal injury take the place of actual assaults, which often are committed by the epileptic. Hence the epileptic temper is much more dangerous to society. The hysterical type of temper is sometimes seen in monkeys. Thus R. Garner[5] tells of a female chimpanzee, that when her male companion was annoyed or vexed by anyone, she never failed to take his part. At such times she became frantic with rage and if the cause was prolonged she often for hours afterward refused to eat. Here we get the same depression following the excitation as is shown by the hysterical young woman.

Davenport tabulates his material and gives family trees showing as many as five generations with an unbroken record of bad temper. The study shows that this trait may be a dominant one in certain families, as it reappears in some of the children of each generation.

"It follows naturally that, since the tendency to violent temper does not skip generations, unaffected members of a fraternity, who select an emotionally controlled consort, will only exceptionally, if ever, have affected offspring."

The following general conclusions are reached:

"1. The tendency to outbursts of temper—'tantrums' in adults—whether more or less periodic or irregular and whether associated with epilepsy, hysteria or mania, or not, is inherited as a positive (dominant) trait, typically does not skip a generation, and tends ordinarily to reappear, on the average, in half of the children of an affected parent.

---

(5) Apes and Monkeys: Their Life and Language, Boston, 1890.

"2. It would seem to follow from the data here presented that epilepsy, hysteria, and mania are not the causes of the violent tempers frequently accompanying them; the violent outbursts are in no clear sense the 'equivalent' of these various psychoses. Rather the violent outbursts of temper are due, in all these associations to a factor that causes periodic disturbance (possibly paralysis of the inhibitory mechanism?). This factor has the greatest effect when acting on a nervous system that is especially liable to show other psychoses. In other words, 'tantrums' are apt to be associated with these various neurotic conditions, while they have no necessary connection with them."

Insanity and the War.

Types of Mental Disease in Soldiers. The following brief description of a number of cases presented at a medical meeting in Hamburg by Weygandt[6] gives the reader a picture of the variety of mental disturbances commonly met. Weygandt begins with the statement that there is no war psychosis in a specific sense. In the great majority of cases a definite predisposition existed and the mental or physical strain merely acted as exciting cause.

Case 1. A soldier who previously occasionally had presented nervous symptoms was unconscious for several days after the battle of Tannenberg. Then hysterical inability to walk (abasia) existed for a time, following which he passed into a state of general sensitiveness and complained of weakness in the arms. The visual fields were greatly narrowed.

Case 2 was also one of hysteria with periods of depression in a soldier who had struck his head against a wall and had been unconscious for a short time.

Case 3. A reservist on preparing himself for the war became nervous, developed hallucinations, spoke of death, detected electricity everywhere and thought he was followed by spies. At times he was stuporous, at other times excited and violent. At the time of report

---

(6) Deutsch. med. Wochenschr., April 29, 1915.

he was in a kataleptic state with automatism. Hence the case was one of the katatonic form of dementia praecox.

Case 4. A musketeer was wounded in the leg while fighting in France on Aug. 26. On Sept. 8 he became excited, confused, loquacious, then negativisitic and violent. Later he became more quiet but was silly and would constantly repeat the same phrases in a stereotyped manner. Also a case of katatonia.

Case 5. A soldier on the eastern front, and an alcoholic, had insufficient food for a time, but succeeded in procuring considerable vodka. On account of some trouble with his feet he entered the hospital and soon developed typical alcoholic delirium, in which he was tussling with mice and Cossacks.

Case 6. A man who 12 years previously had been punished for sexual crimes with children and had had several periods of depression, soon after entering the service in the war became depressed and attempted suicide. As he previously had had two convulsions the suicidal attempt was ascribed to a morbid impulse on epileptic basis and he was released from the army.

Case 7 was one of altered emotional state with excitement and tendency to suicide, also considered a form of psychic epilepsy. A history of convulsive seizures in childhood was obtained. The author had observed several other patients with a history of some epileptic manifestation in early youth and new outbreaks after the excitement and fatigue of the war.

The Psychoses and Neuroses of Soldiers in the War as observed in the clinic for nervous and mental diseases in Königsberg, Prussia, are described by E. Meyer.[7] The number of cases of true psychoses is small. Of the men admitted to the clinic 7.5 per cent. had dementia praecox, 4 per cent. manic-depressive insanity, 3.5 per cent. paretic dementia, while 16 per cent. had chronic alcoholism, and an additional 5.5 per cent. acute alcoholic insanity; 11.5 per cent. were epileptic, 13.5 per cent. classified as constitutional psychopaths and 18 per cent. hysteria. Finally, 6 per cent. were cases of traumatic neuroses and 8 per cent. were imbeciles.

---

(7) Deutsch. med. Wochenschr., Dec. 17, 1914.

The cases of dementia praecox showed no unusual features except a certain war coloring of the delusions. The chronic alcoholics made themselves troublesome in the service by their stupidity or irritability, and sometimes exhibited epileptiform features of a psychic character, such as prolonged fugues. Of the alcoholic psychoses the acute alcoholic hallucinosis (alcoholic paranoia) was more common than delirium tremens. The hallucinations had a strong war coloring: fights with Russians, fear of being shot as spies by their comrades, etc. The acute state was often followed by prolonged weakened mental state with occasional hallucinations or delusions of persecution and rather frequent suicidal attempts. Meyer also comments on the frequency with which psychoneurotic symptoms were produced by the shell explosions near the patient, without any physical injury. The cases presenting the ordinary symptoms of traumatic neurosis were mostly in patients who had been victims of accidents prior to the war. Meyer finds that the functional neuroses produced by the war are more quickly recovered from than the traumatic neuroses in times of peace in which the egocentricity has greater opportunity to be cultivated. This absence of any claim for damages is a favorable feature of the war neuroses.

Meyer draws the conclusion that so far there is no reason to believe that any considerable number of severe psychoses of chronic character come to observation as a result of the war, nor does the latter produce any material coloring of the psychoses. On the other hand the experiences of war frequently give rise to acute psychoses on alcoholic and epileptic basis. Aggravation of epilepsy is frequently observed, and in those predisposed the appearance of psychoneurotic disturbances is favored.

Mobilization as Exciting Cause of Dementia Praecox. J. Jörger,[8] assistant in Bleuler's clinic in Zürich, was in position to study the effects of preparation for war, aside from those of war itself, as Switzerland merely mobilized without participating in the war. He relates the cases of 13 soldiers who became insane soon after

---

(8) Cor.-Bl. f. Schweiz. Aerzte, 1914, Vol. 44, p. 1553.

being called to join the colors. Four patients had already shown mild symptoms of the disease and rapidly became acutely disturbed. Two had previously been in a hospital for the insane, but were having complete remissions at the time of mobilization when the symptoms returned. The remaining patients had previously been considered well, aside from some minor peculiarities, and two of them had been drinking to excess before the onset. The six non-alcoholics in this group rapidly went into a half delirious, half stuporous state. They exhibited great excitement and raved about being shot and dying. The cases of 4 women are also related, in which there was a similar sudden onset with fear of being killed. The duration of the excited state was longer than in the men.

The Effect of the Outbreak of the War on the Inmates of an Insane Hospital was studied by E. Meyer,[9] whose institution is situated in the fortified city of Königsberg, in Prussia, near the Russian border, in surroundings where the strong emotions created in a nation at the outbreak of a war would be expected to penetrate inside asylum walls if such a thing is possible. Fifty-three patients were studied with a view to determine, first, if any change could be observed in their demeanor or if they would spontaneously speak of the war; secondly, if they knew of the war, and if so, in how much detail, whether they considered its possible relation to their own persons or their family and whether any higher emotions, such as patriotism were aroused. The alcoholic dements were indifferent, the ego complex remaining in the foreground. Three paretic officers, while fairly well informed about the war, spoke of it in a flippant manner, while one of them would discuss with great enthusiasm his own excellent appetite and sleep. One paretic who was having a remission revived a previously abandoned delusion that he had invented a bullet-proof armor and became disturbed for a short time, and then dropped the subject. Two paretics and two dementia praecox patients said they were not well enough to go to war. Of seventeen patients with de-

---

(9) Arch. f. Psychiat., 1915, Vol. 55, p. 353.

mentia praecox, only one gave any outward signs of unrest. For a few days he wanted to join the army, but it was curious that while he had previously exhibited delusions of persecution against the Krupp firm, the war seemed to furnish him no further material for these ideas. The anxiety of some of the melancholia patients appeared to be increased, while others refused to be interested, stating that they were only concerned with their own miserable condition. Thus, a woman whose husband, son, and sons-in-law had gone to war, when asked if she felt badly about it, said, "No, but my head hurts so much." Another woman said, "The war does not interest me; my misfortune is greater than anything."

The results of the whole investigation indicated that in the great majority of the cases no outward change could be observed. Most of them realized the existence of war or at least that something unusual was going on. However, this was merely a superficial observation, leading to no further elaboration except in the few depressed cases mentioned and in the paretic with the bullet-proof armor. At first sight it appears surprising that the war did not lead to the elaboration of new delusions, but we must remember that delusions are more prone to be based on personal experiences, which were lacking in regard to the war. It may be said of persons who were insane at the outbreak of the war that the psychic reaction to this event furnished a measure of the emotional life and the susceptibility to ethical and other feelings. The lack of feeling and the unshattered egotism of the chronic alcoholic were especially pronounced and the same was largely true of the victims of paretic dementia and of dementia praecox. In the melancholia cases the increased emotionalism was too firmly bound to the ego complex to allow transfer to any outside matters. Meyer's general conclusion is that on account of the morbid accentuation of the ego complex, no material influence of the outbreak of the war upon existing psychoses could be discovered. After completing this work Meyer had the opportunity to observe seventy female inmates of an insane hospital which for several days had been exposed to Russian fire, resulting in the death and wounding of several patients. After being confined to the cellars for protection they were finally transferred to Dr. Meyer's institution. On their arrival, and also the day after, a few patients spoke of shooting and others wanted to crawl under the beds, but the great majority of them appeared like any other group of insane patients transferred from another institution. Most of them were old cases of dementia praecox. Examination of a number of them, particularly those who had spoken of the war or crawled under the beds, revealed a knowledge that they had been bombarded and of some facts regarding the war. Otherwise the clinical pictures were in no way influenced.

A report along similar lines comes from Scotland. Isabel Emslie[1] describes the effect of the war on the inmates of the Royal Mental Hospital, Edinburgh.

"The melancholics under treatment were utterly apathetic; they heard those around them discussing the war but it did not worry them in the slightest. They took no interest in the news, and were not in the least shocked at the horrors of the war. They did not seem to be at all apprehensive of danger to their country or themselves. They were far too much taken up with their own troubles to bother about anything else. It was only when they were improving that they showed any interest at all in the war.

"The maniacs were affected just as might be expected —always quick to pick up news, words, or phrases; always quick to hear sounds, such as bands and practice firing; always quick to notice any patient's friend who might be in uniform, or any picture of war in the magazines—much of their talk and actions began to be colored by the war. They began to talk familiarly about the various generals and commanders, to talk of guns, soldiers, and sailors, and to shout words of command. Some of the women talked about going to the front to show them how to fight, and demonstrated how they proposed to do so, and some of the male patients have even attempted to enlist.

---

(1) Edinburgh Med. Jour., May, 1915.

"The cases of dementia praecox spoke little about the war unless those in the very early stages of the disease. The delusions here were fleeting and bizarre but very incoherent. One girl said that the war was caused by too much mustard and vinegar having been put in the kaiser's soup, but that cake, apples, and treacle would bring about peace. One early case remarked knowingly that she had caused the war, and that it would never cease until she got her discharge from here.

"Paranoia. The class of case that was quite the most interesting in its relation to the war was the systematized delusional case. Practically all of these patients have taken the greatest interest in the war news, and have followed the course of the war with seeming intelligence, and have entered into discussions with each other and with the staff. The women have worked most diligently at comforts for the soldiers.

"It is surprising to note that although they take such an intelligent interest, yet beneath it all how very distorted their whole view of the war is. The majority of the paranoiacs keep their peculiar delusions well hidden, but occasionally they are found off their guard. Very often the delusion has been got by a nurse who is a special confidante of the patient. Sometimes the delusions have been got by a fellow-patient, which fellow patient has often some equally distorted idea, yet she is much amused by the delusions of the other patient."

"Military Nostalgia," a Mental Disease of Recruits, is discussed in an entertaining manner in the following editorial from an English journal.[2]

"Nostalgia as a specific disease especially afflicting recruits has never figured in English text-books of medicine or mental disease, but our French allies had up to about the year 1877 issued a whole literature on the subject. Switzerland, as we are informed by Jean Jacques Rousseau, was the original home of what was long regarded as a dangerous malady. The Swiss, he asserts, were forbidden to listen to the music of the Ranz-des-Vaches if it happened to be played to them when on the march, since the monotonous strains, associated

---

(2) Lancet, Nov. 28, 1915.

in their minds with home and the mountains, led to desertions, sickness and death. Johannes Hofer, a Mulhouse physician, is perhaps the original authority on *mal du pays,* which he calls 'pothopatridalgia.' His book was published in Basle in 1688. He speaks of a specific disease, tells many stories of its extraordinarily fatal results, and transcribes in quaint notation the music of the Ranz-des-Vaches, or Kuh-Reihen, to the sound of which he directly traces his 'pothopatridalgia.' As years pass the picturesque element in homesickness becomes modified, and in 1837 we find the subject treated at great length and with a complete appearance of scientific justice by Paulinier in a Montpellier thesis. He describes the pallor, taciturnity, absolute dejection, loss of appetite, and so forth, which attack the recruit suffering from homesickness, and adds the curious observation that in the great wars of the French Republic the illness was unknown owing to the enthusiasm of the soldiers for France, every inch of which had become home in their regard. Later, when the Napoleonic wars had sapped the vitality of the nation, the condition of *mal du pays* became almost epidemic among the boy recruits of 1812 and the following years. There is little to choose between Paulinier's views and those of many of his successors. They all describe much the same set of symptoms. Writing as lately as February, 1863, an American army surgeon, De Witt C. Peters, speaks of the incidence of this form of melancholia among young recruits drawn from the Eastern States of the Union and sent to fight in the, to them, enervating climate of the south. 'The hospitals of New Orleans,' he says, 'during the past summer were filled with such cases. . . . The majority of them were young men from the Eastern States, whose love of home and kindred is a characteristic trait.' His definition of the symptoms tallies with that of his predecessors. 'The symptoms produced by this aberration of mind are, first, great mental dejection, loss of appetite, indifference to external influences, irregular action of the bowels. and slight hectic fever. As the disease progresses it is attended by hysterical weeping, a dull pain in the head, throbbing of the temporal arteries, anxious expression of the face, watchfulness, and increased fever and wasting. Among young prisoners of war it is the worst complication to be encountered, as the writer can truthfully affirm.' We can only trust that as our allies and ourselves are fighting with high hopes in an inspiring cause such a form of mental depression is unknown or rare among them. The Italians speak familiarly of nostalgia as a disease of recruits.''

Peculiar Episodes of Depression, Apathy and Excitement in Officers. Max Löwy[3] relates observations of a peculiar mental state in several Austrian officers who had suffered reverses and deprivation in the Serbian campaign. There was no neuropathic predisposition, but, as the result of the severe exertions and emotions of war, episodes of excitement and reactive depression occurred. Sometimes the apathy predominated, sometimes the excitement, but most frequently there was an intermingling of all these states. These patients took an unreasonably pessimistic view of the prospects in the war, exaggerated the unfavorable factors and could not be made to see the favorable ones. They were very irritable and excitable; though looking tired and sleepy they slept poorly and were troubled by terrifying dreams colored by their war experience. Simultaneously there seemed to exist restlessness and apathy, with a disturbance of mental concentration causing breaks in the continuity of thought obvious to the observer and the patient alike, and impairment of immediate memory (Merkfähigkeit'') could be demonstrated by having the patient repeat figures. This disturbance of concentration was not identical with the apathy and drowsiness referred to but existed both in excited and apathetic episodes and remained for weeks after the patients had enjoyed thorough rest. Examination regularly revealed increased knee jerks, and frequently concentric narrowing of the visual fields, analgesia of the extremities or hemianalgesia, and tremor. Nearly all the patients were reduced in flesh and exhausted; many of them suffered from poor appetite and exhaustion. The course was favorable, with recovery after several weeks of rest, so

---

(3) Monatschr. f. Psychiat. u. Neurol., 1915, Vol. 37, p. 387.

many of the patients were able to return to the front.

"Mental Shock" in Soldiers as Observed in the Base Hospitals in France is well described by William Aldren Turner,[4] a prominent English neurologist.

"From time to time cases are sent down from the Casualty Clearing Stations in a state of mental stupor. Some of these cases are unaccompanied by any history or statement which would throw light upon the cause or method of onset of the symptoms. Other cases of a similar though less profound type of stupor, on recovery from the acuter phases, are able to give some account of the nature of the psychical shock through which they have passed.

"The symptoms exhibited by these cases of stupor are interesting and create a clinical picture of a striking character. In the more severe class of case the patient is entirely unconscious of his surroundings. All the usual tests applied with the object of arresting attention—such as throwing a bright light on to the eyes, pinching the skin, or clapping the hands close to the ears—fail to provoke a response. The deep reflexes, however, are normal or brisk, and the plantar response is of the flexor type. The pupillary light reflex is frequently impaired or lost. Urine is passed normally; swallowing is carried out usually without difficulty.

"In some cases the patient would appear to be living again through an experience of the past, probably associated with the time of onset of the symptoms. In a very striking instance the patient lay curled up under the bedclothes. From time to time he would look out, as if peering over the parapet of a trench, stare wildly around him, and then hide under the clothes. These actions were often repeated and lasted for several days with gradually diminishing frequency. In another case of a somewhat similar character the patient would suddenly start and sit up in bed and look around him, crying out, 'He's gone, he's gone.' It was subsequently ascertained that this patient's brother had been killed when fighting beside him in the trench. Many of these cases present a scared or startled appearance.

---

(4) Brit. Med. Jour., May 15, 1915.

When approached they shrink and hide under the bedclothes. Others are dull, lethargic, and apathetic, taking no interest in what is going on around them.

"A closer examination reveals a marked degree of rigidity of the limbs in most of the cases. As a rule all the extremities are affected; the thighs are tightly flexed upon the abdomen and the fingers clenched in the hands. In one case there was a decided tendency to katatonic rigidity. In another case of genuine shock the rigidity had a hemiplegic distribution affecting the left arm and leg. In this case the deep reflexes upon the left side were exaggerated and the plantar response was abolished.

"In the milder type of case the stupor is less profound. These patients may carry out simple actions, such as putting out the tongue when requested to do so, but in a slow, apathetic, and hesitating way. They present a dazed appearance, are readily startled when spoken to, and take little or no notice of what is going on around them. Even in the slightest cases some rigidity of the limbs may be detected, which gradually passes off as the mental condition improves.

"A consideration of these cases shows that the patient is probably in a state comparable to what is observed in the 'hysterical stupor' or hypnoidal state of civil practice. The evidence would seem to show that he is living through some past experience of a terrifying kind. When information has been obtained upon the possible cause or origin of the symptoms it has been found to be of a psychical character, such as seeing a friend or relative killed by his side.

"On the other hand, there were cases of a severe type in which no history was obtained. It is permissible to assume that they may have resulted from shell explosion, or from repeated and continuous shelling. These symptoms are found mainly in young soldiers; in no case has the patient been over 28 years of age, the majority being about 22 or 23.

"The duration of the stupor varies. In some cases the intensity of the shock has passed off before admission to the base hospital. In those admitted in stupor the symptom persisted for several days and then suddenly passed away, the patient having no recollection of what had taken place in the interval. In other cases a more gradual recovery ensued, the patient being sent home before complete recovery had taken place. The general outlook for recovery is decidedly favorable. Rest, quiet surroundings, and ample nourishment are the main points of treatment."

DEMENTIA PRAECOX.

Somatic Signs in Dementia Praecox—Especially Adrenalin-Mydriasis. This subject is discussed in interesting manner by J. H. Schultz,[5] of the University of Jena. In 1898 Lewandowsky showed that intravenous adrenalin injections in rabbits produced symptoms similar to those of irritation of the cervical sympathetic, among them being dilatation of the pupils, protrusion of the eyeball and widening of the palpebral fissure. This has been thoroughly corroborated and enlarged upon by other observers. Thus S. J. Meltzer has shown that, while frogs have dilatation of the pupils on mere instillation of adrenalin, mammals show no such dilatation until the superior cervical sympathetic ganglion has been extirpated. This ganglion has an inhibitory effect on the action of adrenalin. Removal of the pancreas, thyroid feeding, ligation of the thoracic duct and artificial saturation with adrenalin also permit mydriasis to occur on simple instillation of adrenalin in the eye, all of which shows that disturbances of internal secretion may produce adrenalin mydriasis. The phenomenon has been observed in diabetes and scleroderma, less often in exophthalmic goiter.

Cords [6] has written a monograph on the subject from the ophthalmological standpoint. Before testing, the patient should sit for at least fifteen minutes in uniform light and the instillation should not be made until the pupils have remained of a consistent size for a time. Two drops of 1-1000 adrenalin are instilled three times

---

(5) Monatschr. f. Psychiat. u. Neurol., 1915, Vol. 37, p. 205.

(6) Die Adrenalin Mydriasis und ihre diagnostische Bedeutung. Wiesbaden, 1911.

within 5 minutes. The eye is kept closed for 10 minutes, then the pupil is measured and again every 15-30 minutes. In sympathetic paralysis the dilatation sets in rapidly but in cases of disordered internal secretion 30-60 minutes may elapse.

Schultz made the test in 150 cases; 28 were instances of known organic disease; 4 paretics out of 9 reacted positively, also 2 cases of multiple sclerosis and 2 senile dements; 48 cases of "functional" psychoses and neuroses, exclusive of dementia praecox, nearly all reacted negatively. On the other hand, of 53 clinically certain cases of dementia praecox, 28 reacted frankly positive. Several cases gave a paradoxic reaction, namely contraction of the pupil.

To determine further the cause of the phenomenon, an estimation was made of the quantity of vasoconstrictor substances in the blood of 40 dementia praecox patients and in the spinal fluid of 31. In 18 of the former a distinct decrease existed (hypadrenalinaemia?), while the spinal fluid contained a considerable amount of such substance, thought possibly to be of hypophyseal origin.

The Blood in Dementia Praecox. Edwin Goodall[7] discusses this subject and fixes its present status as follows:

"Summarizing our present knowledge, it may be stated that in the earlier phases of dementia praecox there is a moderate increase in the total white cell count, with relative increase of the neutrophiles. Thereafter in marked exacerbations of the morbid processes these increases are more pronounced. The ordinary picture is that of a relative lymphocytosis. The progress towards dementia is characterized by a persistence of this, with a low total count; this appears to be the view held, but I would refer to a chart which follows as to this point. There is no sufficient evidence of differences—quantitative or qualitative—in the cell-counts in the different forms of dementia praecox, though in quite a recent communication Kulm and Purdum confirm Sandri's statement as to the high proportion of lymphocytes in the katatonic variety. The need of more extensive obser-

---

(7) Lancet, Dec. 12, 1914.

vations, for comparative observations in respect of the different forms, for observations in the very early stages of the morbid process, is, I believe, greater in the disorders grouped under this heading than in other kinds of insanity. The physical condition of many cases of stupor and katatonia bears a resemblance to that found in myxedema, in which disease there is also a relative lymphocytosis.''

The Changes in the Brain in Dementia Praecox. In previous volumes we have called attention to the data gathered along anatomic, psychologic and chemical lines in the effort to solve the mystery of the etiology of this mental disease. In some quarters the psychogenic view prevails, while others contend that organic changes in the brain are responsible for the disease. A most formidable array of facts in favor of the latter view is presented by E. E. Southard,[8] whose previous work on the same subject was reviewed in the Practical Medicine Series, 1910, Vol. X, p. 229. Southard now has made a systematic anatomic and histologic study of 25 cases and believes that it goes very far toward placing dementia praecox in the structural group of mental diseases.

''Previous work of several authors had left much to be desired in respect to proof of the structurality of this disease because reliance was placed on microscopic examination and the observation of various cell changes, some of which might well be reversible or terminal or intercurrent, or even agonal. Even the initial conclusions of Alzheimer concerning deep-layer cortical gliosis in katatonia (1897) are now replaced by Kraepelin (1913) with an emphasis on changes in supra-stellate layers. Nor did any authors seem to reckon with the fact that such microscopic changes as are sometimes adequately described must inevitably leave, as a rule, some macroscopic trace, if the disease had lasted a long enough time (say three months, more or less). Accordingly, in the absence from the literature of all systematic gross brain study in dementia praecox, at least of such study in any large series of cases, I undertook to fill the gap,

---

(8) Amer. Jour. Insan., 1915, Vol. 71, p. 601.

and have fortunately been able, through grants from the Massachusetts State Board of Insanity, to execute the work with the aid of systematic brain photography. Careful and systematic autopsy protocols, brain photographs systematically taken, and microscopic sections in all cases of possible doubt as to gross diagnosis, have formed the basis of the work on the structural side.''

At least 90 per cent. of the brains examined gave evidence of focal brain atrophy or aplasia even without the use of the microscope, and in all cases microscopic changes were found. The atrophies and aplasias, when focal, show the tendency to occur in the left cerebral hemisphere. The coarse atrophy was usually of so moderate a degree as not to alter the brain weight materially. A certain amount of internal hydrocephalus was found in at least 9 cases. As to functional correlations, the author inclines to the view that delusions are as a rule based on frontal disease, katatonic symptoms on parietal lobe disease and auditory hallucinations on temporal lobe disease.

MANIC-DEPRESSIVE INSANITY.

Psychoanalysis in Manic-Depressive Insanity. August Hoch[9] gives a brief account of investigations of manic-depressive insanity along psychologic and largely psychoanalytic lines. He begins with a recapitulation of the essentials of the Freudian views, which is so clear and shorn of the usual obscurities that it is well worthy of quotation:

''Since these studies deal in part with Freudian psychology, it is indispensable to say a few words about this, more especially to mention some facts and some formulations which seem to me fairly safe, or at any rate useful for the study of psychiatry. In the first place, we must mention the existence of *unconscious motives.* Irrespective of any facts brought out by psychoanalysis, it is easiest to demonstrate these by the so-called post-hypnotic suggestion. We imply by this term the fact that we can experimentally create motives for

---

(9) Bull. Johns Hopkins Hosp., May, 1915, p. 165.

action, which actions are later carried out without the motive entering consciousness. This is the first fundamental fact to keep in mind.

"The second important fact is that Freud, for the first time, revealed to us a new world of such unconscious motives of which we had been practically ignorant. He insisted, in this connection, on the importance of early life, and pointed out that motives then created do not disappear but undergo a further development. On account of this further development they have in their original form stopped being a reality to the normal adult consciousness. On analysis, however, Freud found —to take up only one set—invariably unconscious motives which referred to the first attachment of the individual, *i. e.*, the attachment to the parents; more particularly did he find motives connected with great love for the parent of the opposite sex.

"The possibility must *a priori* be admitted that such early attachment might play a rôle in the development of the adult love instinct. But the adult love contains sensual elements which are not present in the child and not contained in the tender feelings toward the parents. As puberty approaches, these sensual feelings manifest themselves, however. The great task of puberty seems to be the solution of the bonds of home and the transference of affection in part, together with the sensual feelings, to new objects, in the service of the instinct of propagation. This is not possible to every individual, and the assumption is made that in such cases the current of the sensual impulses flows then in the direction of the tender feelings, *i. e.*, toward the parent. Since there is, however, a strong opposition to this on the part of the conscious personality, this sexually intensified part of the attachment for the parent remains repressed and unconscious. We may say, therefore, that in the course of development certain steps did not take place. This arrest of development in the sphere of instinctive desires, which represent the very center of the personality, results in a defective adaptation, especially in the sexual sphere. When it is therefore stated that there is a sexual cause in every neurosis, this does not imply a sexual cause in the adult sense but in the sense that the cause lies in the imperfect instinct development.

"The unconscious has different depths, as it were, and these infantile motives, which we have just mentioned, are undoubtedly among the deepest repressed strivings.

"But now we must mention another point: In order to understand these infantile motives, we must free ourselves from our adult logical thinking and meet our patients on their infantile level. Most people, knowing that Freud has spoken of sexual causes and of the longing for the parent, simply combine and translate this into terms of adult sexuality. This is probably wrong, precisely because the formulation is too adult. The ideas expressed in the psychosis are often much more vague, expressing more a desire for some sort of possession. In the benign psychoses, in which we have chiefly studied women, this longing is often expressed in the wish to die with the father and the wish for removal of the mother. Let me briefly cite a case: A woman becomes neurotic when she gets engaged. After marriage she first refuses to submit to the marriage relation, and then develops a psychosis in which the ideas expressed are essentially that her marriage is annulled, her mother dead, and that she herself is following her father into his grave, is united with him in his coffin. In other words: She was unable to adapt herself to her married life, and regressed to a union with her father. This is not sexual in the adult sense, though it is an evidence of imperfect sexual adaptation that she could not comfortably fulfil her marriage obligations.

"And here is another important point, namely, the thoroughly illogical nature of this, as of all other trends in such and similar psychoses. I will mention only one among many illogical features. On logical grounds it is absurd to wish—and we regard the delusions as expressions of unconscious wishes—that the mother should die, when all that is desired is to be united with the father in death. But the psychosis does not think logically but artistically, as Bleuler has expressed it. The wish for the mother's death or removal exists, because to the child she is the rival in the affections of the father.

We must not forget that the ideas expressed in psychoses are often, so far as we know, direct emanations of unconscious desires which cannot be understood by the observer or the patient when standards of logical thinking are applied to them. And, when we try to cast them into logical or adult forms, we are doing something which is, strictly speaking, not possible, and the formulation is apt to become one-sided and artificial. To recognize this is important. The vagueness of these trends is not due to our imperfect knowledge of them so much as to their very nature, and we are not improving matters if we make them clearer than they are.

"It has been said that the infantile motives, upon which Freud lays so much stress, have been revealed by a method which is questionable, owing to the great latitude given in it to interpretation. But in studying the psychoses we find exactly the same motives as those which Freud has inferred, and here very often no complicated interpretation is needed, since the unconscious desires are expressed directly in the ideas of the patient. This is what should make the central claims of psychoanalysis so convincing to the psychiatrist. Freudian psychology, however, can be understood only when the dynamic importance of the deepest infantile motives is fully grasped, and this is a side on which even much of the psychoanalytic literature does not lay adequate stress, since it emphasizes more the method and the motives which are more closely related to our adult way of thinking. The psychoses, more than anything else, impress us, however, with the importance of the infantile motives."

In their work on the manic-depressive cases Hoch and his collaborators first of all made a study of the content of the psychosis, *i. e.*, the ideas expressed by the patient, and they were more and more driven to a study of the relationship between the content and the emotional reaction. They found that certain types of content were characteristic of certain forms of reaction. In women in states of stuporous depression they very often found the idea of dying with the father and visions of the father beckoning. As this recalled a frequent form of infantile longing mentioned above, the significance at once became apparent. Hoch uses as an illustration the type of retarded depression in women apparently precipitated by the death of the mother.

"The content of these depressions was quite superficial, and the death of the mother played no rôle in it. Further study of the content of retarded depressions showed us that this very superficial nature of the trend is the rule. It is, of course, natural enough, one might say, that a woman is sad when her mother dies, but it is not natural that she should develop a retarded depression, and it certainly is quite striking, and in need of explanation, that the idea of the mother's death should be wholly in the background of her thoughts, during the depression. An old experience, which had never been understood, then came to mind, namely, the character of the so-called reactive depressions. It will be remembered that in these depressions the sequence of events is as follows: Something happens which worries the patient, and the same thing continues to worry him so long as the depression lasts. But—and this is the interesting point—these depressions are not associated with retardation.

"We argued, therefore, that in the retarded depressions, due to the death of the mother, the precipitating cause must act in a different way from the precipitating cause in the reactive depressions. Now, we knew the infantile unconscious motives, and we knew the fact that the idea of the mother's death often appears as a delusion, therefore as a wish, in other types of benign clinical pictures with different precipitating causes. Therefore we concluded that in these women who develop retarded depressions after the death of the mother, the psychosis is the result of the fulfilment of an unconscious wish.

"We then found that this principle, namely, the principle that precipitating causes of psychoses act, not through their superficial, manifest meaning but through the significance which they have for the unconscious wish life, we found, I say, that this is a widespread and important principle."

TABLE OF CONTENTS.

DISEASES OF THE NERVOUS SYSTEM.

SYMPTOMATOLOGY 5- 9
THE NEUROSES 9- 49
  Neuroses of the War 9- 18
  Vagotonia 18- 28
  Epilepsy 28- 39
  Migraine 39- 45
  Raynaud's Disease 45- 47
  Psychoanalysis 47- 49

THE CEREBROSPINAL FLUID AND DISEASES OF THE MENINGES 49- 59

SYPHILITIC DISEASES OF THE NERVOUS SYSTEM 59- 78

DISEASES OF THE BRAIN 79- 92
  The Cerebrum 79-114
  The Basal Ganglia 92-106
  The Pineal Body 106-109
  The Hypophysis 109-114

DISEASES OF THE SPINAL CORD 114-138
  Traumatic Affections 114-119
  Spinal Decompression 119-123
  Toxic Affections 123-127
  Syringomyelia 127-131
  Multiple Sclerosis 131-133
  Acute Anterior Poliomyelitis 133-136
  Spinal Cord Tumor 136-138

DISEASES OF THE SYMPATHETIC AND SPINAL GANGLIA 138-146

DISEASES OF THE PERIPHERAL NERVES 146-158

MISCELLANEOUS 158-168

MENTAL DISEASES.

GENERAL CONSIDERATIONS 169-190

MENTAL DEFECT AND DELINQUENCY 190-213

INSANITY AND THE WAR 213-224

DEMENTIA PRAECOX 224-227

MANIC-DEPRESSIVE INSANITY 227-231

INDEX.

Abderhalden reaction in insanity, 182
Acrocephalosyndactylism, 165, 167
Adrenal, right, malignant sympathicus tumor of, 140
Adrenalin-mydriasis, 224
Adrenals and sympathetic, tumors of, 138
Alcoholism and epilepsy, hereditary relation between, 36
  chronic, and cerebral edema, 53
  loss of pupillary light reflex from, 164
Anemia, pernicious, cord changes in, 123
  pernicious, showing family tendency and mental symptoms, 123
Arsenic content of serum in terms of salvarsan, 70
Artery, subclavian, cervical rib causing thrombosis of, 164
Asthma, bronchial, and vagotonia, 24
Atrophy, muscular, Charcot-Marie type of, 158
Atropine in vagotonia, 23
Auditory nerve affections in syphilis, 65

Benzine, cord lesion from poisoning with, 125
Blood in dementia praecox, 225
Brain, diseases of, 79
  gliomatous tumors of, 86
  in dementia praecox, changes in, 226
Bronchial asthma and vagotonia, 24

Cardiac neurosis, 26
Cardiospasm, 25
Carotids, common, treatment of epilepsy by partial compression of both, 37
Cerebral and spinal concussion, 12
  complications of whooping-cough, 79
  edema, 50
  edema in chronic alcoholism, 53
  tonectic apparatus, 96
Cerebrospinal fluid and diseases of meninges, 49
  fluid and effect of lumbar puncture in delirium tremens, 57
  fluid, origin and circulation of, factors of influence in, 49
Cerebrum, 79
Cervical rib causing thrombosis of subclavian artery, 164
Charcot-Marie type of muscular atrophy, 158
Children, insanity in, 185
Colitis, mucous, 25
Coma, relative frequency of various forms of, 83
Constipation and epilepsy, 28
  spastic, 25
Corpus callosum, puncture of, in pituitary tumor, 109
  striatum and its relation to muscle tonicity and emotional expression, 92
  striatum, is it a purely vestigial organ and devoid of function, 99

Cortical lesions, superficial, inability to move toes except in walking in, 82
Crime, relation of "pfropfhebephrenia" and dementia praecox to, 209
Cutaneous pain sense, clinical research on, by means of faradic needle, 8

Deaf mutism produced by shock from shell explosion, 12
Defense reflexes, 5
Delinquency and mental defect, 190
Delinquent, individual, 190
Delirium tremens, cerebrospinal fluid and effect of lumbar puncture in, 57
Dementia, paretic, and sleeping sickness, comparison of, 77
  paretic, demonstration of spirochaete pallida in, 76
  paretic, surgical treatment of, 76
  praecox, 224
  praecox and "pfropfhebephrenia," relation to crime, 209
  praecox, blood in, 225
  praecox, changes in brain in, 226
  praecox, mobilization as exciting cause of, 215
  praecox, somatic signs in, 224
Depression, apathy and excitement in officers, peculiar episodes of, 221

Edema, cerebral, 50
  cerebral, in chronic alcoholism, 53
Edinger's exhaustion theory, application of, to types of paralysis, 7
Encephalitis due to inhalation of fumes of gasoline, 81
Epilepsy, 28
  a manifestation of imperfectly developed libido in persons of psychosexually inferior makeup, 32
  a symptom of infection of intestinal tract by a specific, probably gas-forming bacillus, 28
  and alcoholism, hereditary relation between, 36
  nature of, 28
  treatment by partial compression of both common carotids, 37
Exhaustion, Edinger's theory, application of, to types of paralysis, 7
  nervous, in war, polyneuritis accompanying, 157
Expression, emotional, and muscle tonicity, relation to corpus striatum, 92

Family tendency in pernicious anemia, 123
Faradic needle, clinical research on cutaneous pain sense by means of, 8
Feeblemindedness, psychoses engrafted upon, 204
Feebly inhibited, 210

Ganglia, basal, 92
  sympathetic and spinal, diseases of, 138
Ganglioneuroma of sphenomaxillary fossa, 141
Gasoline, encephalitis due to inhalation of fumes of, 81

Hemianopsia, permanent, and migraine, 41
Hemiplegia and migraine, 42
  or paraplegia, functional, 13
Herpes zoster and radicular paralysis of arm, 145
  zoster, etiology and experimental production of, 144
Hibernation and hypophysis, 113
Hydrocephalus, chronic, hypopituitarism in, 110

Hypophysis, 109
  and hibernation, 113
Hypopituitarism in chronic hydrocephalus, 110
Hysteria, convulsive form of, 12
  in war, 10
Insane, alleged, in criminal cases, reform of expert testimony and provision for hospital observation of, 173
  hospital, inmates of, effect of outbreak of war on, 216
  out-patient and "after care" work in connection with state hospitals for, 177
Insanity, Abderhalden reaction in, 182
  and war, 213
  in children, 185
  manic-depressive, 227
  sex organ changes in, 180
Intestinal disorders, 25
Intraspinal treatment, 65

Laminectomy in apparently hopeless wounds of cord, 116
Laryngospasm and atropine, 24
Lenticular degeneration and pseudosclerosis, liver changes in, 105
  degeneration, progressive, and pseudosclerosis, three cases resembling, 103
Liver, changes in, in pseudosclerosis and progressive lenticular degeneration, 105
Loss of personality from shell shock, 16
Lumbar puncture in delirium tremens, 57

Manic-depressive insanity, 227
Meckel's ganglion, affections of, 142
Meninges, diseases of, and cerebrospinal fluid, 49
  syphilis of, 59
Meningomyelitis, spinal decompression in, 119
Mental defect and delinquency, 190
  disease in soldiers, types of, 213
  diseases, 169
  diseases, classification of, 186
  diseases, general considerations, 169
  disorder, types of personality associated with occurrence of different types of, 171
  symptoms in pernicious anemia, 123
Mercurialized serum, intraspinal injection of, 74
Migraine, 39
  paralytic and other persistent sequelae of, 39
Military nostalgia, a mental disease of recruits, 219
Muscle tonicity and emotional expression, relation to corpus striatum, 92
Muscular atrophy, Charcot-Marie type of, 158
Myotonia atrophica, 159

Nasal or sphenopalatine ganglion, affections of, 142
Nerve, auditory, in syphilis, 65
  concussion due to bullet and shell wounds, 151
  median, articular and trophic complications of wound of, 155
  optic, lesions of, and migraine, 43
Nerves, mixed, polyneuritis of, in neurasthenic soldiers, 156
  peripheral, clinical, individuality of, 149
  peripheral, diseases of, 146
  peripheral, war injuries of, 153, 155
  wounds of, by bullets, shrapnel, etc., 146
Nervous disorders, functional,

- in connection with wounds in war, 14
- exhaustion in war, polyneuritis accompanying, 157
- system, diseases of, 5
- system, diseases of, symptomatology, 5
- system in syphilis, early involvement of, as demonstrated by examination of spinal fluid, 61
- system, syphilis of, extensive clinical study of, 60
- system, syphilitic diseases of, 59

Neurasthenic soldiers, polyneuritis of mixed nerves in, 156

Neuritis, false, 13

Neuroses, 9
- and psychoses of soldiers in war, 214
- cardiac, 26
- of war, 9
- traumatic, and war, 9

Nostalgia, military, a mental disease of recruits, 219

Ocular palsy, tabetic, pathology of, 63

Ophthalmoplegia and migraine, 40

Optic nerve, lesions of, and migraine, 43

Out-patient and "after care" work in connection with state hospitals for insane, 177

Pain sense, cutaneous, clinical research on, by means of faradic needle, 8

Palsy, tabetic ocular, pathology of, 63

Paralysis agitans, clinical study of, 162
- application of Edinger's exhaustion theory to types of, 7
- painful, of arm or leg in war, 13
- of arm, radicular, and herpes zoster, 145

Paralytic and other persistent sequelae of migraine, 39

Paraplegia or hemiplegia, functional, 13

Parasyphilitic diseases, so-called, relation of syphilis to, 63

Paretic dementia and sleeping sickness, comparison of, 77
- dementia, demonstration of spirochaete pallida in, 76
- dementia, surgical treatment of, 76

Pathological lying, accusation, and swindling, 201

"Pfropfhebephrenia" and dementia praecox, relation to crime, 209

Pilocarpine in vagotonia, 23

Pineal body, 106
- body, histology of, 106

Pituitary tumor with improvement after puncture of corpus callosum, 109

Poliomyelitis, anterior, acute, 133
- microbic cause and manner of infection, 133

Polyneuritis accompanying nervous exhaustion in war, 157
- of mixed nerves in neurasthenic soldiers, 156

Pseudosclerosis, 101
- and progressive lenticular degeneration, liver changes in, 105
- and progressive lenticular degeneration, three cases resembling, 103

Psychoanalysis, 47
- ethical aspects of, 47
- in manic-depressive insanity, 227

Psychologic training for physicians, need of, 169

Psychoneuroses of war, 11

Psychoses and neuroses of soldiers in war, 214

combined, 182
engrafted upon feeblemindedness, 204
Pupillary light reflex, loss of, from alcoholism, 164
Pylorospasm, 25

Raynaud's disease, 45
Reflex, light, pupillary, loss of, from alcoholism, 164
Reflexes, condition of, in complete section of cord, 117
defense, 5

Salvarsan, arsenic content of serum in terms of, 70
Salvarsanized serum, intraspinal injection of, 73
Sclerosis, multiple, 131
multiple, visual disturbances in early stages of, 131
Serum, arsenic content of, in terms of salvarsan, 70
mercurialized, intraspinal injection of, 74
salvarsanized in vitro, intraspinal injection of, 73
Sex organ changes in insanity, 180
Shock, emotional, following shell explosion, 15
loss of personality from shell, 16
mental, in soldiers as observed in base hospitals in France, 222
Simulation in war, 13
Sleeping sickness and paretic dementia, comparison of, 77
Soldiers, mental disease in, 213
Sphenomaxillary fossa, ganglioneuroma of, 141
Sphenopalatine or nasal ganglion, affections of, 142
Spinal and cerebral concussion, 12
and sympathetic ganglia, diseases of, 138
cord changes in pernicious anemia, 123
cord, condition of reflexes in complete section of, 117
cord, diseases of, 114
cord injuries in war, 114
cord, laminectomy in apparently hopeless wounds of, 116
cord lesion from poisoning with benzine, 125
cord, traumatic affections of, 114
cord tumor, 136
cord tumor, sensory symptoms of, 136
decompression, 119
decompression in meningomyelitis, 119
fluid, examination of, early involvement of nervous system in syphilis as demonstrated by, 61
Spirochaete pallida in paretic dementia, demonstration of, 76
Stomach, vagotonic disorders of, 24
Sympathetic and adrenals, tumors of, 138
and spinal ganglia, diseases of, 138
Syphilis, auditory nerve affections in, 65
early involvement of nervous system in, as demonstrated by examination of spinal fluid, 61
intraspinal treatment, 65
of meninges, 59
of nervous system, extensive clinical study of, 60
relation of, to so-called parasyphilitic diseases, 63
Syphilitic diseases of nervous system, 59
Syringomyelia, 127
pathology of, 127
remissions in, 127

Tabetic ocular palsy, pathology of, 63

Tachycardia, permanent, of emotional origin, 14
Toxic affections, 123
Tumor, malignant sympathicus, of right adrenal, 140
  of third ventricle, 89
  pituitary, with improvement after puncture of corpus callosum, 109
  spinal cord, 136
  spinal cord, sensory symptoms of, 136
Tumors, gliomatous, of brain, 86
  of sympathetic and adrenals, 138

Vagotonia, 18
  and bronchial asthma, 24
  associated conditions, 27
  general, clinical picture of, 21
  pathologically increased, 23
  therapeutic considerations, 27
Ventricle, third, tumor of, 89
Visual disturbances in early stages of multiple sclerosis, 131

War and insanity, 213
  and traumatic neuroses, 9
  effect of outbreak of, on inmates of insane hospital, 216
  injuries of peripheral nerves, 153, 155
  neuroses of, 9
  polyneuritis accompanying nervous exhaustion in, 157
  psychoneuroses of, 11
  psychoses and neuroses of soldiers in, 214
  spinal cord injuries in, 114
Wet Brain: See Cerebral Edema
Whooping-cough, cerebral complications of, 79

INDEX TO AUTHORS.

Alexander, 79
Athanassio-Bénisty, 14, 82, 149
Auerbach, S., 7

Babinski, J., 5, 146
Baehr, E. M., 50
Baudouin, 145
Beifeld, A. F., 53
Berkley, H. J., 207
Bernhardt, 155
Bissell, W. W., 83
Briggs, L. V., 178
Bronner, A. F., 194
Byrnes, C. M., 74

Cadwalader, W. B., 103
Campbell, C. M., 185
Carati, E., 8
Clark, L. P., 32
Clark, S. N., 171
Claude, H., 118
Cords, 224
Councilman, W. T., 86
Curschmann, H., 160
Cusning, H., 113
Davenport, C. B., 210
Davis, B. F., 165
Dejerine, 14, 117, 123, 164
Dejerine, J., 155
Dewey, K., 59
Dimitz, L., 182
Dorner, G., 125
Dunn, J. S., 141
Dzierzynsky, 168

Eastman, J. R., 37
Ellis, A. W. M., 65
Elsberg, C. A., 136
Ely, 186
Emslie, I., 218

Feiling, A., 16
Fernsides, E. G., 60, 161
Fiessinger, 15
Fildes, P., 76
Flexner, S., 133
Frazier, C. H., 49
Fries, E., 182

Gadelius, B., 167
Garner, R., 212
Gascuel, 14
Glomset, D. J., 140
Goetsch, E., 113
Goldstein, K., 115
Goodall, E., 77, 225
Gorrill, G. W., 183
Greenfield, 160

Harbitz, F., 138
Head, H., 60
Healy, M. T., 201
Healy, W., 190, 195, 201
Hess, L., 18
Hickson, W. J., 209
Hoch, A., 227
Hunt, J. R., 39, 160

Jelliffe, 186
Jörger, J., 215

Kennedy, 160
Kennedy, F., 131
Krabbe, K. H., 106
Kubitz, A., 105

Lantuejoul, 145
Le Count, E. R., 59, 83
Leopold, 62
Leszynsky, W. M., 109
Lewandowsky, M., 116
Lind, J. E., 182
Lloyd, J. H., 99
Lorenz, W. F., 183
Löwy, M., 221

MacCurdy, J. T., 47
Mann, L., 157
Marburg, O., 116
Margulis, M. S., 127
Marie, P., 14, 82, 149
McIntosh, J., 76
Mees, 165
Meyer, A., 169
Meyer, E., 214, 216
Mills, C. K., 92
Momberg, 38
Mouzon, 117, 123, 164
Muskens, L. J., 116

Nacht, 79
Neurath, R., 79
Nonne, 156, 165

Oberndorf, 160
Oftedal, S., 144
Ogilvie, H. S., 73
Oppenheim, H., 9, 101, 114, 153
Osborne, O. T., 45

Passek, M. P., 76
Patek, A. J., 124
Peet, M. M., 49
Petit, A., 118
Pollock, L. J., 89, 110
Potts, C. S., 81

Reed, A. L., 28
Rhein, J. H. W., 185
Risch, 202
Rogers, A. W., 123
Rosenow, E. C., 144
Roussy, G., 11

Sceleth, C. E., 53
Schultz, J. H., 224
Schwartz, E., 155
Shinoya, 41
Singer, H. D., 171
Sioli, F., 182
Sluder, G., 142
Smith, 186
Souques, 145, 158
Southard, E. E., 226
Spaulding, E., 195
Spiller, W. G., 63
Staemmler, M., 105
Stähle, E., 127
Stearns, A. W., 178
Stedman, H. R., 176
Steinebach, R., 57
Stephenson, J. W., 119
Sterling, 166

Stevens, J. W., 183
Stokes, J. H., 61
Strümpell, A., 79
Stuchlik, J., 36
Swift, H. F., 65

Taylor, A. S., 119
Tetzner, 160
Thinh, 82
Trömner, E., 162
Tubby, A. H., 151
Turner, W. A., 222

Wahl, 139
Wasner, M., 204
Weygandt, 213
White, W. A., 186
Wiegmann, E., 79
Wildman, H. V., jr., 205
Wile, U. J., 61
Wright, J. H., 138